FLIGHT, JANUARY 10, 1935

FIRST AERO WEEKLY IN THE WORLD

REGD. AT THE G.P.O AS A NEWSPAPE

FLIGHT

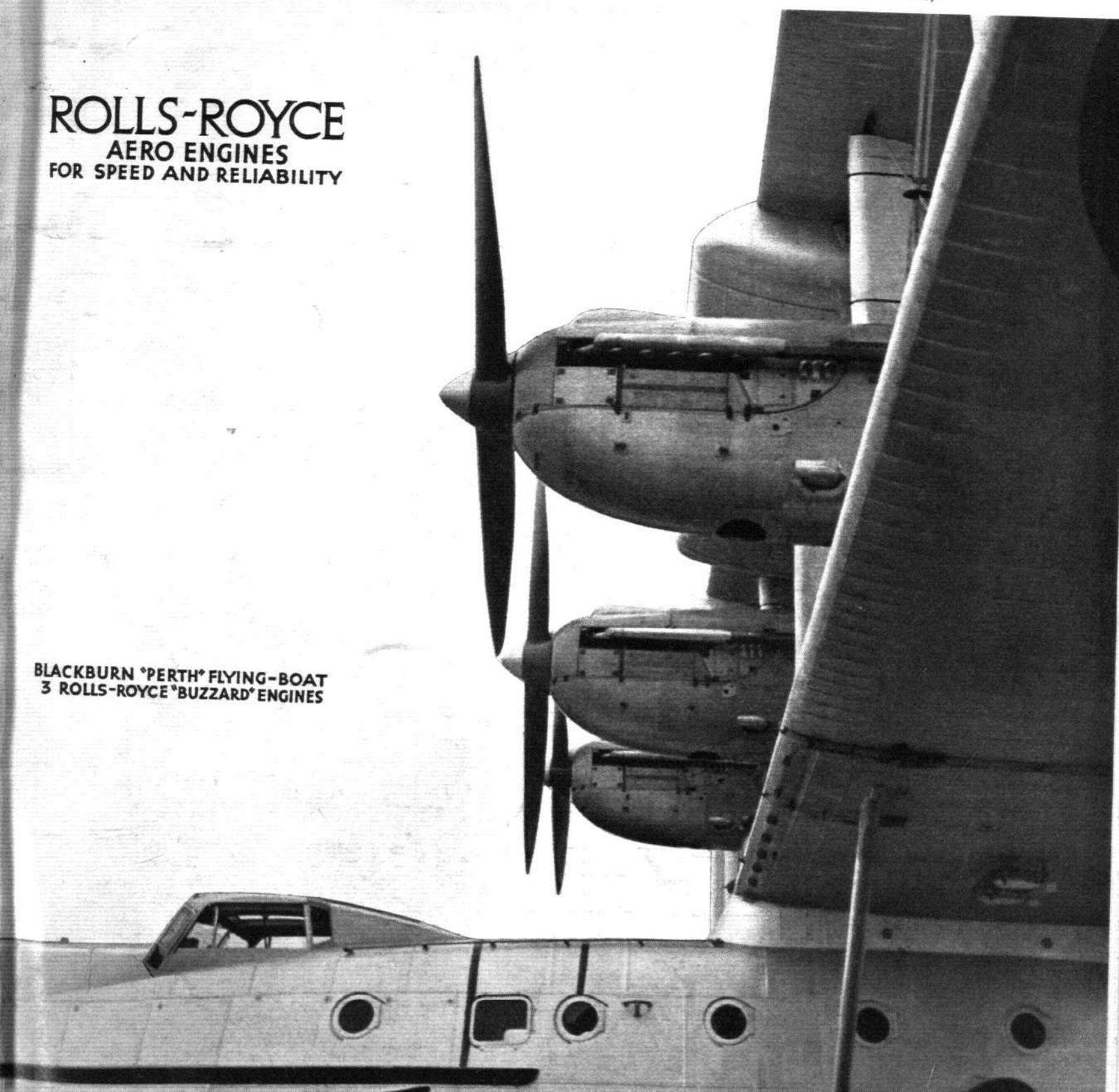
The AIRCRAFT ENGINEER AND AIRSHIPS

No. 1359
Vol. XXVII

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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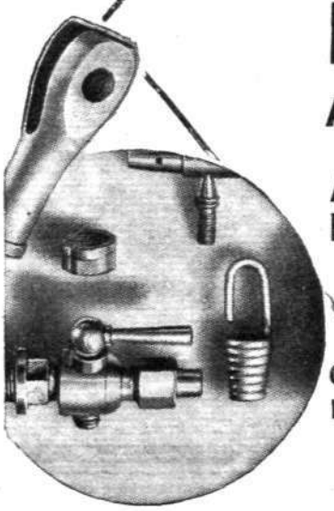
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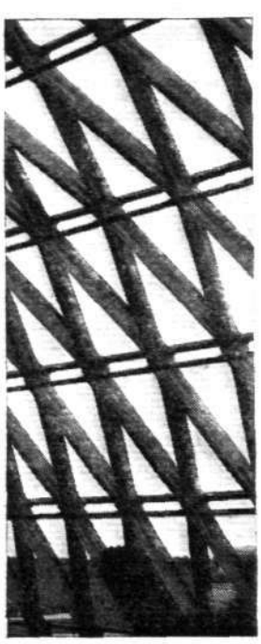
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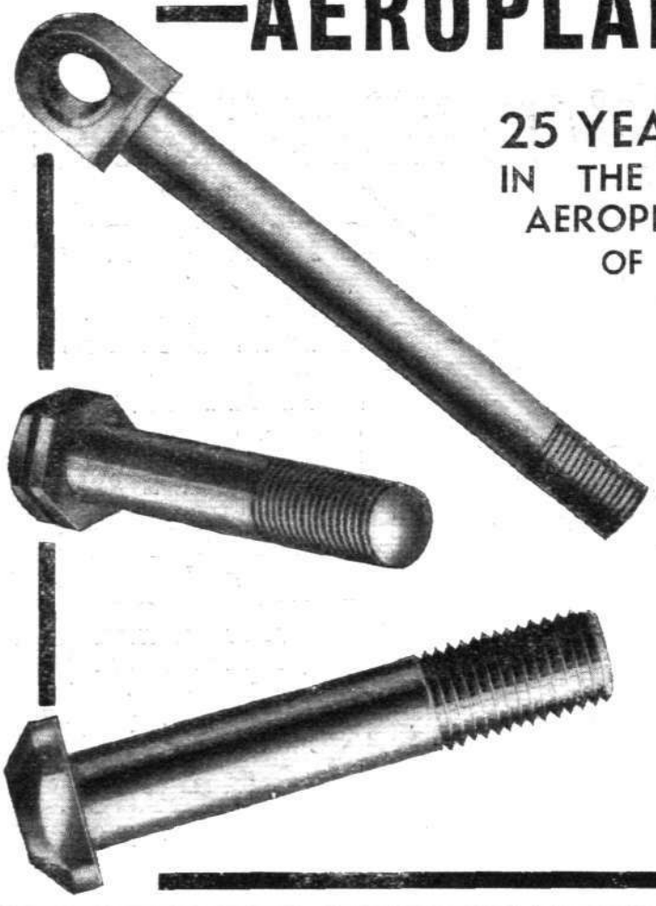


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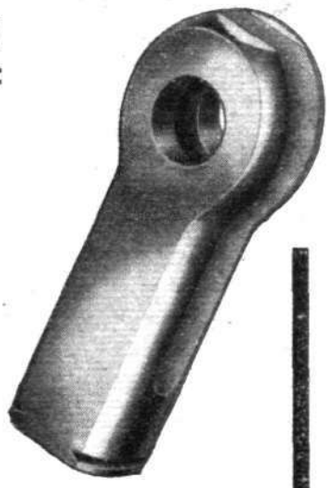
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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

Founded in 1909

FIRST AERONAUTICAL WEEKLY IN THE WORLD

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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Desires and Hopes

WHAT will 1935 bring forth to the world of flying? There are many things which we should like to see brought to pass in this year. First and foremost comes satisfactory progress with the programmes for Empire air lines and for R.A.F. expansion. We should also like to see a really sensible scheme of internal air lines and airports drawn up. We should like to see Great Britain recover some of the important world records, e.g., speed, altitude, and distance. Very emphatically we want to see appropriate and adequate steps taken to reduce the dangers of the power grid. With equal emphasis we want to see the tax on aviation petrol removed, or drastically reduced. Aids to bad weather flying by means of wireless control need development. The rules for the control of civil flying ought to be simplified. Of less general application, but very desirable, is a good railway connection between Croydon and central London.

We feel sure that during the year further investigation of a commercial air route across the Atlantic will be made, and in this connection we may mention the Mayo composite aircraft as holding out considerable promise. Likewise we feel that we need hardly call for energetic research for the development of a British controllable-pitch airscrew, evaporatively-cooled engines, C.I. engines, sleeve-valve engines, and direct-injection engines. This research is certain to take place. More work will also doubtless be done on devices for widening the speed-range, such as flaps and slots. Much work has been done lately on increasing the speed of military aircraft, but still more needs to be done, and there is plenty of scope for effort in the direction of cleaning up these machines.

Aeroplanes for the private owner are already good, but we may hope to see them still better by the end of 1935, and if they could be turned out much cheaper than in the past flying would receive a great impetus. To those who wish to learn to fly but cannot afford to learn at a flying club, we would point out the desirability of joining the R.A.F. Reserve as a sergeant-pilot and being taught to fly *ab initio* at the public expense. Men who pursue this course benefit by receiving free training, while they do a service to the State and help to make Great Britain more secure. In 1935 we want to see the R.A.F. Reserve expanded far beyond all previous limits.

Such are some of our hopes; they are surely not extravagant.

Anti-Aircraft Units

BELOW we give extracts from *Air Defence*, by Major General E. B. Ashmore, which was published in 1929. It is perhaps unnecessary to remind our readers that Gen. Ashmore was in command of all the air defences of London at the end of the War, and afterwards was in command of the ground troops of air defence and was appointed Inspector of Anti-Aircraft. He therefore has full knowledge of the subject, though he was an officer of the Army and not of the R.A.F.

> The organisation of the (ground) defences has, in fact, shown a fundamental weakness, due to divided responsibility between the War Office and Air Ministry. . . . The ground troops have two masters pulling in opposite directions; the R.A.F. only want them efficient, the War Office only want them cheap. The Observer Corps . . . was handed over to the Air Ministry at the beginning of 1929. The sooner the rest of the ground organisation, the anti-aircraft guns and searchlights follow the Observer Corps and come under the Air Ministry for administration and finance, as well as for operations, the better. Such a change should not involve any insuperable difficulties. The ground troops are Territorials, administered by County Associations; the Air Ministry has already Territorial units of its own, administered in the same way.

We are moved to make the above quotations by the news, emanating from the military correspondent of the *Daily Telegraph*, that a considerable part of the existing London Territorial divisions is to be converted into anti-aircraft units. He anticipates that 100 more search-

light and A.A. artillery units may be required, with a personnel of some 40,000 officers and men. It is to be hoped that these units will be provided with the latest patterns of searchlights, guns, sound-locators, lorries, etc., and at the same time that the existing anti-aircraft units will be re-equipped with modern equipment.

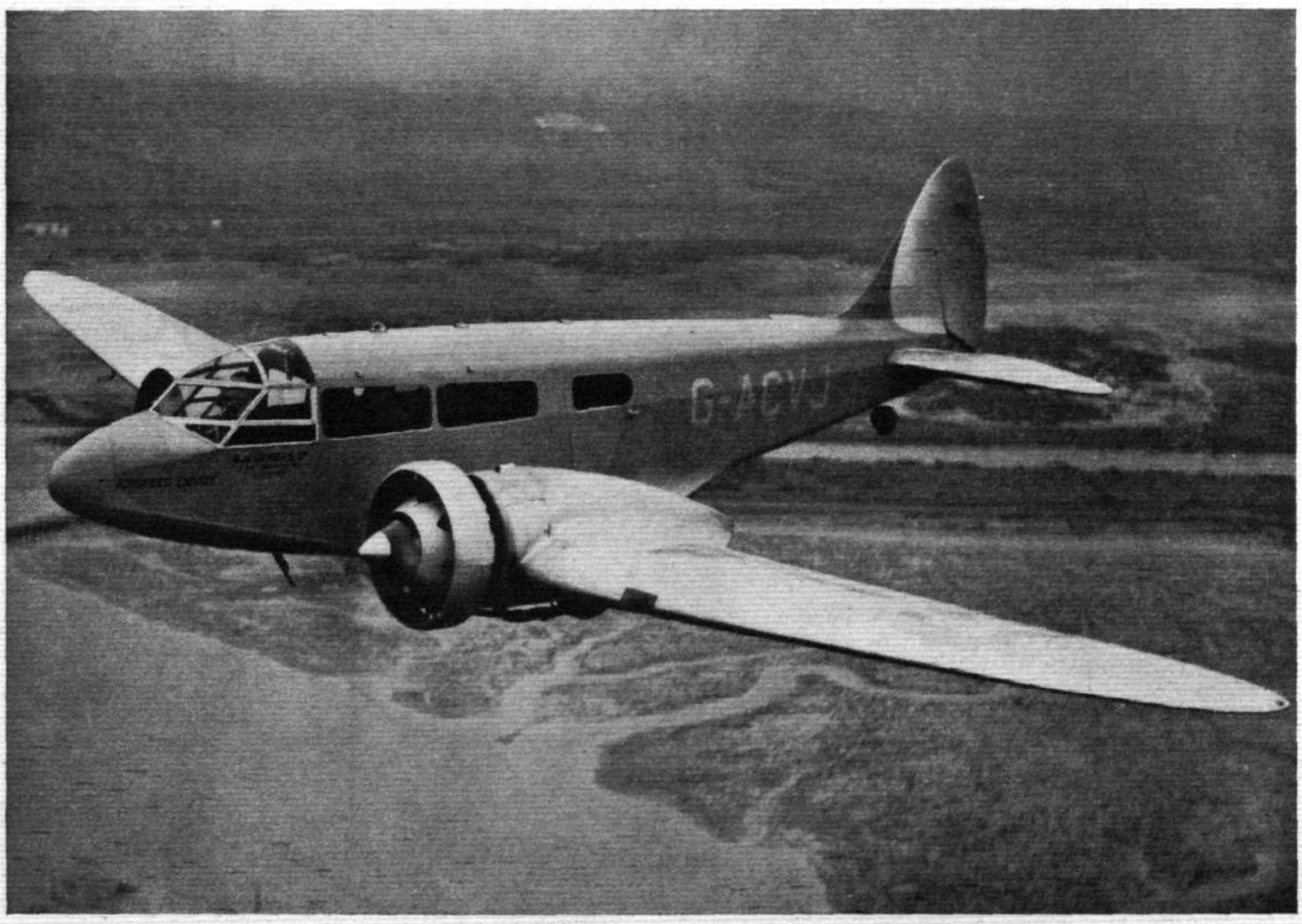
The present condition of the Territorial anti-aircraft units is really a scandal. While the searchlight and A.A. artillery units of the regular Army have the latest pattern of guns, searchlights, and sound-locators, the Territorial units have had to be content with equipment of an ancient pattern which would be of little use in modern warfare. It must be realised that the regular units are not available for the air defence of London and other cities, though they have sometimes been lent to the Air Officer Commanding-in-Chief Air Defence of Great Britain during exercises. The work of the regular units is to protect the Army's lines of communication, dumps, etc., from air attack, and if the Army goes overseas those units go with it. Only the Territorial units are under the command of the A.O.C.-in-C. Air Defence of Great Britain. It is to the fighter squadrons that we look chiefly to inflict losses on raiding bombers, but the fighters are practically helpless unless they receive the most extremely efficient help from the ground units of the organisation. The life of the capital depends to an almost terrifying extent on the efficiency of the Observer Corps and Territorials.

Apparently, questions in Parliament and the generally changed attitude of the Cabinet towards defence matters have prodded the War Office into activity in this matter. Hitherto, as Gen. Ashmore said, the War Office has been "reluctant to find money for a defence that has been expressly removed from its control." The fundamental mistake has been to leave a vital matter—a matter on which the safety of London might depend—in the care of a department which has no particular interest in it. It is all very well to talk about the British genius for compromise, and arrangements working through good-will and tact on both sides. The principle is wrong, and in this case it has led us into grave danger.

A *Pernicious Doctrine*

Equally pernicious and dangerous is the doctrine that the Army must provide anything which moves or rests on the ground. Air Defence is the most important of the manifold responsibilities of the Air Ministry, and every element of the air defence organisation ought to be completely under the control of the Air Ministry. It is the Air Council which ought to have the financial responsibility for equipping the ground units.

The matter is so important that it is rather surprising that regular units are not allotted for working the guns, searchlights, etc., but if it is the considered opinion that part-time men can do the work really efficiently, then those men should belong to the Auxiliary Air Force, and not to the Territorial Army. We have reason to believe that the personnel of the existing A.A. units would raise no objection to such a transfer.



MODERN BRITISH DESIGN.—This view of the "Lynx"-engined Airspeed "Envoy," taken by a *Flight* photographer over Langstone Harbour, Portsmouth, admirably illustrates its "clean" lines. A description of the machine appears on pages 30-31.

The Outlook

A Running Commentary on Air Topics

Youth's Opportunity

THE boyhood desire to be an engine driver has, for the greater part, given way to a yearning to fly. For aviation has captured the imagination of youth. Once the "air bug" selects a young victim, the lad becomes irrevocably air-minded. Reading *Flight*, flying models, and visiting aerodromes serve only to excite his passion—they provide no outlet. If his means are limited, he yearns and worships from afar.

But now, it would seem, the day is near when, if a youth can prove that he earnestly wishes to fly, if he can give his assurance that his means do not enable him to obtain instruction in the ordinary way, and if he is prepared to pay half the cost of his tuition (usually about £12), he will be enabled to take his "A" licence at a recognised club. The Air League "Young Pilots' Fund" will come to his aid. It is the object of this newly instituted fund to halve the cost of flying for approved applicants. As money is received, young men desirous of learning to fly will be invited to apply for assistance, and every sum they subscribe will be doubled by the fund. It is stipulated that applicants must join the Air League, the chief reason given for this being that all overhead charges for the administration of the fund can be accepted by the Air League, and donations received devoted to flying assistance.

Practical Points

A SUCCESSFUL applicant will learn to fly at the nearest recognised club to his home. Unless some arrangement can be made whereby the charges for tuition at the various clubs are standardised, the prospective pupils will, so to speak, be forced to take the rough with the smooth. Payments to the fund will be in proportion to the fees charged by the club. It may be possible that the increased numbers of pupils will enable clubs to lower their rates of instruction. Perhaps a readjustment of Air Ministry subsidies will be necessitated.

It is estimated that if the fund reaches £10,000 about 800 young men will be enabled to "take their tickets." Co-operation of employers is, of course, essential to the success of the scheme. If pupils are able to receive instruction only at week-ends, clubs will be flooded out, so it is to be hoped that young men will, if necessary, be given "time off" from business.

Lord Londonderry, Secretary of State for Air, in congratulating the Air League on the scheme, said that he was glad to have the assurance that the fund would operate through existing clubs; it was therefore calculated to afford them assistance and encouragement.

In connection with the fund a ball is to be held in London on May 23.

Modern Starting

MODERN aero engines can generally be started from the cockpit. Various methods are used, the most common being an electric motor comparable with that used in a car. On large multi-engined aircraft a small petrol engine is carried in the fuselage and pumps mixture into the engines, thus "turning over" and starting them. Probably this latter method involves less weight than would individual electric motors for each engine, but even a small petrol engine is heavy and unsuitable for use on small or medium-sized multi-engined aeroplanes. This would seem to be an obvious opening for a small, high-speed, electrically driven pump, which, from a distributor, would deliver mixture to each engine and allow starting by an ignition coil—as has been done successfully on the Wolseley aero engines. An electric motor would be much lighter than a petrol engine, though it is true that the matter of the battery must be taken into account—probably an additional one would be required.

Persian Restrictions

A GOOD deal of adverse comment has from time to time been levelled at the Persian Authorities for their apparent attitude to private owners of aircraft flying in that country. However, according to one who has recently flown there, the restrictions imposed by the authorities are by no means as ill-judged as they may at first seem.

It is perfectly true that the formalities necessary to obtain a permit to fly down the Persian Gulf and in Persia are very considerable, but there is every indication that the obstacles raised are the outcome of the peculiar political situation. First, public security in the more remote places is by no means perfect—although, generally speaking, law and order prevail—and the Government apparently fear that if they permitted private flying without very strict control, foreign aviators might come to grief at the hands of brigands, and thereby give foreign powers provocation to interfere in the internal affairs of the country.

Secondly, police control of the movements of the population in general, both foreign and native, is very strict, and the restrictions on private flying are merely precautions against possible contacts between local tribesmen (who may be hostile to the Government) and unauthorised flyers, regardless of the latter's nationality.

Persia is an extremely mountainous country, and therefore not one which is likely to become a centre for air touring, but its geographical position does make it probable that the number of applications for permits to cross the country is likely to increase considerably within the next few years. It behoves everyone, therefore, to realise that irksome rules can best be mitigated by complying with them; to do otherwise will almost certainly result in further restrictions being imposed.

Imperial Air Routes

IN his lecture to the Royal Aeronautical Society last Monday, Mr. F. Snowden Gamble, of Imperial Airways, explained in non-technical language some of the difficulties with which an air-operating company like Imperial Airways has to contend. The lecture was, perhaps, hardly suitable for the august body before which it was delivered, except where it touched upon geographical, economic, and political aspects. The part of the lecture which dealt with these bore out almost word for word statements made in *Flight* during the weeks following the England-Australia Race, when sections of the daily Press attempted to stampede the community into thinking that we were being left very far behind in the speed of our air services. There is no need to repeat the explanations here, but it is gratifying to have confirmation of *Flight's* views from a representative of the largest British aircraft operating company.

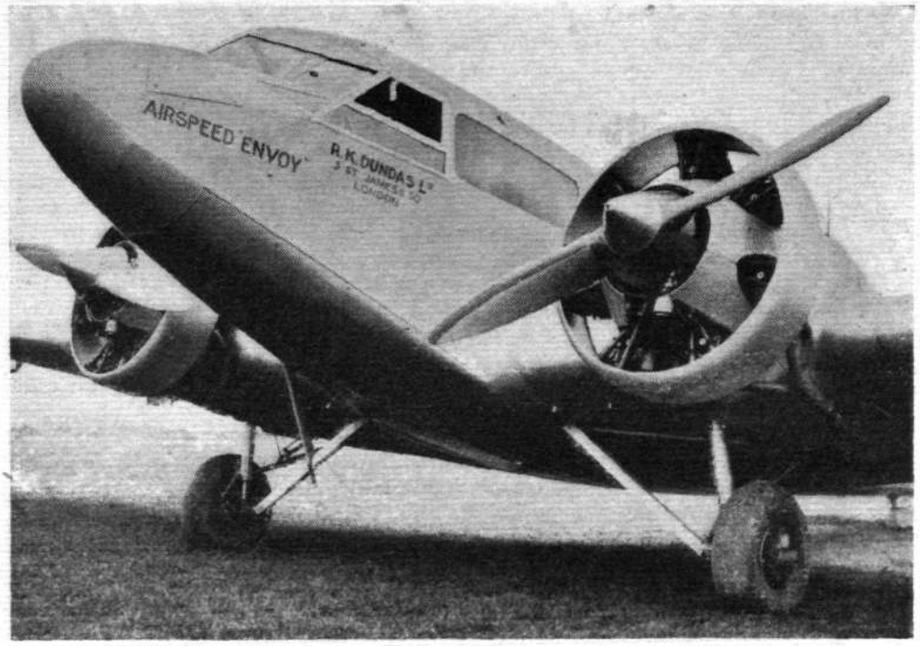
FOR FAST COMMERCIAL TRANSPORT

The Airspeed "Overseas Model," with "Lynx IV.C" Engines : A Wide Choice of Equipment and a High Performance

KNOWN as the "Overseas Model," an improved version of the "Envoy" has recently been produced at the Portsmouth works of Airspeed, Ltd. It is fitted with two "Lynx IV.C" engines (240 h.p. at 2,090 r.p.m.), which give a top speed of 174 m.p.h. Basically, this "Envoy" is practically identical with that built for the late Mr. C. T. Ulm, and differs but little from the Wolseley-engined "Envoy" which was described in *Flight* of July 12, 1934.

The cabin of this new model can be arranged either as a six- or eight-seater, and the performance in general considerably surpasses that of the previous machine. Certain structural alterations to the centre section of the wing have enabled the all-up weight to be increased to 5,850 lb., which means that, despite the extra weight of the larger engines, a usefully large payload is still permissible, with a long range.

The well-known Airspeed retractable undercarriage is retained, and behind the engines are fairings very similar to those placed behind the "Cheetah" engines in the "Viceroy," which Capt. Stack flew in the England-Australia Air Race. The leading edge of the outer portions of the wings has now been completely covered with plywood extending from the top of the front spar around the leading edge to the bottom of the front spar, thus making a structure both rigid in torsion and so strong that it will not be damaged when pushed against while manhandling the machine. The cabin upholstery



The "Overseas Envoy" with its Townend ring-cowled "Lynxes."

A side view of the "Lynx"-engined "Envoy." R. K. Dundas Ltd. are the Airspeed agents. (*Flight* Photographs.)

DATA—AIRSPEED "OVERSEAS MODEL"

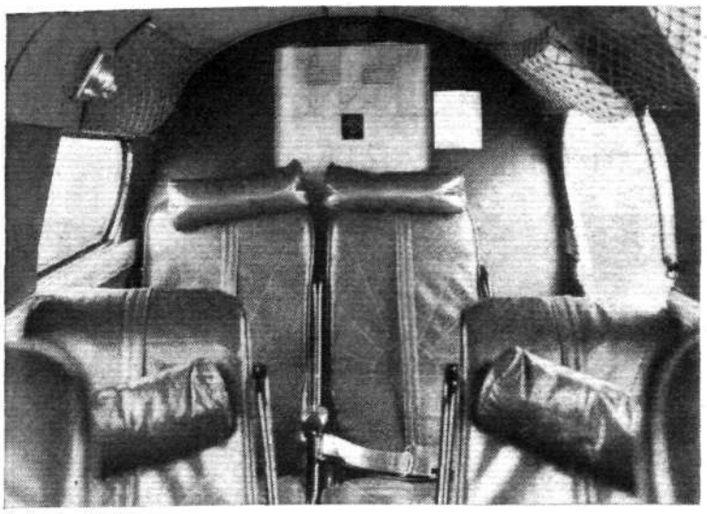
Tare weight (8-seater)	3,780 lb. (*1 712 kg*)
Tare weight, plus pilot (170 lb.) (*77 kg*)	3,950 lb. (*1 789.3 kg*)
Petrol consumption per hour	24 gall. (*109 l*)
Oil consumption per hour	3.5 to 6 pint (*2–3.5 l*)
Maximum speed at sea level	174 m.p.h. (*280 km/h*)
Maximum speed at 5,000ft. (*1 524 m*)	170 ,, (*273 ,,*)
Maximum speed at 10,000ft. (*3 048 m*)	166 ,, (*267 ,,*)
Take-off run, 5 m.p.h. (*8 km/h*) wind	270 yd. (*247 m*)
Landing run, 5 m.p.h. (*8 km/h*) wind, with brakes	240 yd. (*219 m*)
Cruising speed ... 153 m.p.h. (*246 km/h*)	Landing speed ... 64 ,, (*103 km/h*)
Rate of climb at sea level 1,070 ft./min. (*5.4 m/sec.*)	Service ceiling 16,500ft. (*5,020 m*)

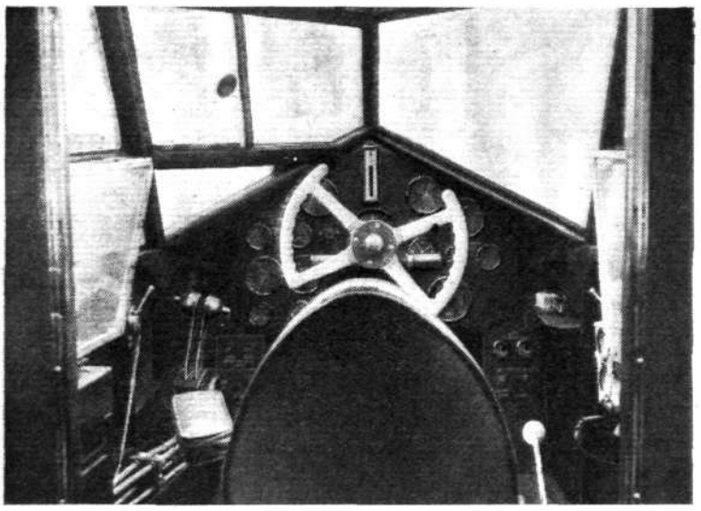
PAYLOAD AT VARIOUS RANGES.

		Standard Tanks.				Extra Tanks.		
Range (miles) ...		200 (*321 km*)	300 (*482 km*)	400 (*644 km*)	*638 (*1 028 km*)	800 (*1 287 km*)	1,000 (*1 609 km*)	
Fuel (gallons) ...		31 (*141 l*)	47 (*214 l*)	63 (*286 l*)	100 (*454 l*)	125 (*568 l*)	157 (*714 l*)	All-up Weight
Oil (gallons) ...		6 (*27 l*)	7 (*32 l*)	8 (*36 l*)	10 (*45 l*)	12 (*54 l*)	14 (*64 l*)	
Pay-load at	Full load .	1,600 (*725 kg*)	1,471 (*667 kg*)	1,340 (*608 kg*)	1,031 (*468 kg*)	820 (*372 kg*)	559 (*253 kg*)	5,850 (*2 654 kg*)
	¾ load ...	1,125 (*510 kg*)	996 (*452 kg*)	865 (*392 kg*)	556 (*252 kg*)	345 (*156 kg*)	84 (*38 kg*)	5,375 (*2 438 kg*)
	½ load ...	—	—	—	—	—	—	—

Note.—If wireless is installed the weight must be deducted from the payload.
* Maximum range with standard tanks at cruising speed.







(Left) Looking aft in the "Envoy" Cabin. Let into the bulkhead is the Plessey A.C.44 wireless set. (Right) A view forward into the pilot's cockpit; the handle on the right of the seat is for raising or lowering the undercarriage. (*Flight* Photographs.)

has been done, like that of so many of the well-equipped and comfortable aircraft nowadays, by L. A. Rumbold and Co., and in the model we tried the seats were very comfortable indeed.

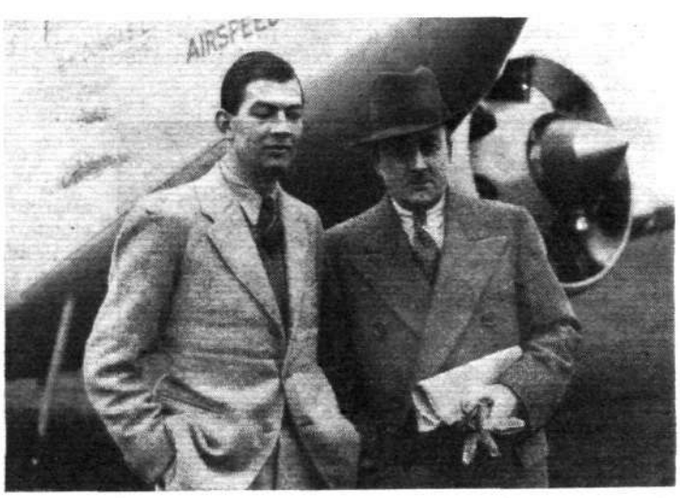
The general equipment is very full, with small folding tables and an ash-tray for each seat. A Plessey A.C.44 wireless set is let into the after bulkhead of the cabin in a very neat manner, the remote control being contained in a very small box and mounted close by the pilot's right hand. Behind the after bulkhead is a spacious luggage compartment. The internal arrangements of the cabin can, of course, be varied to suit any individual operator's wishes, but the arrangement just described is one which should have a wide appeal for those whose flights are likely to be upwards of 400 miles.

In the air the "Envoy" had all the attributes of a fairly heavily loaded high-speed machine—that is to say, in bumps the movement was comparatively hard, short, and sharp, but without producing any particularly disagreeable sensation in the passengers. Flaps have not been fitted, as the manufacturers feel that not only are the take-off and landing adequately short without their use, but that their incorporation would entail an increase of structural weight which would result in an undue decrease of pay-load. The take-off, considering that no flaps are fitted, is good; and, in the matter of landing, it must be remembered that the undercarriage, when in the lowered position, acts to a certain extent in the same manner as would flaps—that is to say, it increases the drag very considerably, and steepens the glide of the machine appreciably. Thus, although the "Envoy" is a clean machine with a high performance, it is still possible to land it off a steep approach over high obstacles.

We did not, on this occasion, have the opportunity of piloting the machine, but from what we saw, and from the opinion of pilots who have flown it under both good and very bad conditions, it is clear that it retains all those most desirable characteristics which were embodied in the Airspeed "Courier," which was described in *Flight* of March 23, 1933.

There is, of course, the usual tail-trimming gear, consisting of a screw-operated mechanism which alters the position of the leading edge of the tail plane; and, in addition, a rudder bias gear is fitted which enables the machine to be flown hands off with one engine cut out. Another refinement which many pilots will like is the aileron bias gear, whereby lateral trim can be altered, not only for single-engine conditions, but also to allow for the idiosyncrasies of pilots, the majority of whom fly with one wing slightly lower than the other.

It is difficult to imagine any aeroplane which allows a better outlook from the pilot's cockpit. The deep, vee-shaped windows are at such an angle that they do not collect fine rain or snow, and are low enough to permit the pilot to look almost vertically below him. The large window in the front on his left-hand side is also split vertically, so that when the visibility is really bad half the window may be slid to one side, leaving an opening through which he can see clearly.



Sir Alan Cobham (right) with his pilot, Flt. Lt. H. C. Johnson, who is flying the "Envoy" to India. (*Flight* Photograph.)

About the operation of the retractable undercarriage we need say very little, as this has been described very fully in connection with previous Airspeed machines; the pump handle at the right-hand side is easy to work.

This particular "Envoy" has been built for demonstration in India, and it left this week, *via* Spain, where Sir Alan Cobham, who was accompanying it, hopes to demonstrate. It will be flown by Flt. Lt. H. C. Johnson.

An Autogiro at Sea

A series of difficult tests was brought to a conclusion last Saturday, when Mr. R. A. C. Brie repeatedly alighted on and flew off from a 33ft. wide platform temporarily rigged on the Italian cruiser *Fiume*. The tests took place off Spezzia, while the vessel was steaming at 24 knots.

Mr. Brie had previously flown on and off the platform while the vessel was stationary. His take-offs were rendered more difficult by the fact that the funnel was just ahead of the platform, so that a climbing turn had to be made each time. The Autogiro used by Mr. Brie was of the C.30 direct-control type, fitted with a Siddeley seven-cylinder "Genet Major" engine.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

"Formating" in France

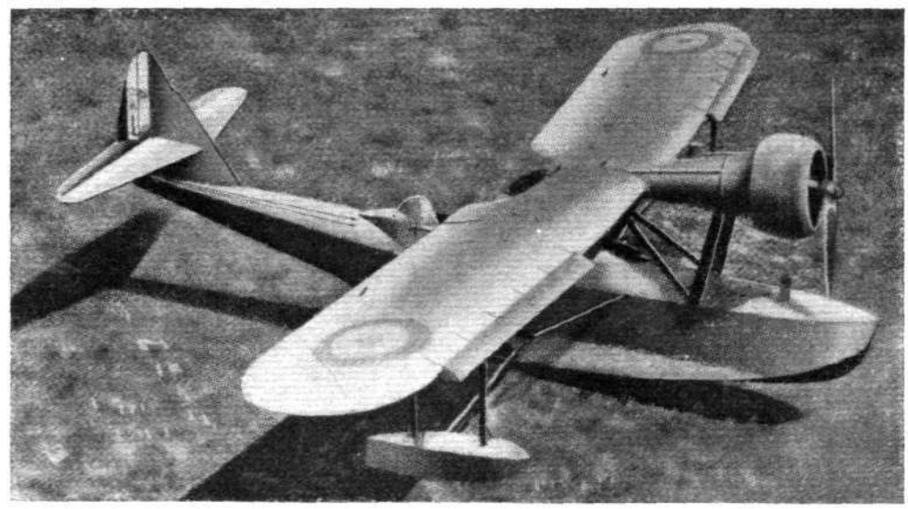
Last Sunday four Autogiros were delivered to the French Army by air from England. The four machines were flown over more or less in formation, the pilots being Messrs. Marsh, Richardson, Yates and Dale.

Viking Graves on Aerodrome

While levelling work was being carried out for the new airport of Stockholm at Bromma, a complete Viking burial ground was uncovered, with many of the graves, remains and valuable relics in an excellent state of preservation.

Kenya Flight Completed

Gen. and Mrs. A. C. Lewin, who left Heston in a Miles "Hawk Major" on November 26 to fly home to Kenya, have reached their destination. They landed, owing to an air-lock in the petrol pipe, about 20 miles short of Kisumu on December 12, the rest of the journey being completed by lorry.



CATAPULTABLE. The Potez 452 shown here is designed to be catapulted from naval vessels. Its wings are arranged to fold and a Hispano Suiza 9Qd radial of 600 h.p. gives it a maximum speed of 137 m.p.h.

Twenty-five Years Ago

From "Flight" of January 8, 1910.

"According to statistics published in Germany the strength of the aerial fleets of the different European Governments during the present year will be: Germany, 14 dirigibles and 5 aeroplanes; England, 2 dirigibles and 2 aeroplanes; France, 7 dirigibles and 29 aeroplanes; Austria, 2 dirigibles and 4 aeroplanes; Russia, 3 dirigibles and 6 aeroplanes; Spain, 1 dirigible and 3 aeroplanes; Italy, 3 dirigibles and 7 aeroplanes."

A Fast Burnelli

Under construction in the works of the Burnelli Aircraft Corporation, at Keyport, New Jersey, is a fourteen-passenger machine embodying well-known Burnelli features and fitted with two Wright "Cyclones" of 725 h.p. It is estimated that the maximum speed will be 235 m.p.h. and the range 1,240 miles.

Coast Guard Amphibians

Nine Grumman FJ-1 amphibians of a type now being supplied to the U.S. Navy for operation from aircraft carriers have been ordered by the U.S. Coast Guard. They will be used for rescue work at sea and will accommodate two stretchers and a doctor. It is intended that they should be operated from the new patrol boats of the service.

British Engines Abroad

The Belgian Government has placed a large order for aero engines with the Rolls-Royce Co. for use in Service aeroplanes to be built in Belgium. British—Rolls-Royce—engines are also being supplied to Denmark, Holland, and Portugal.

A Business Flight to Africa

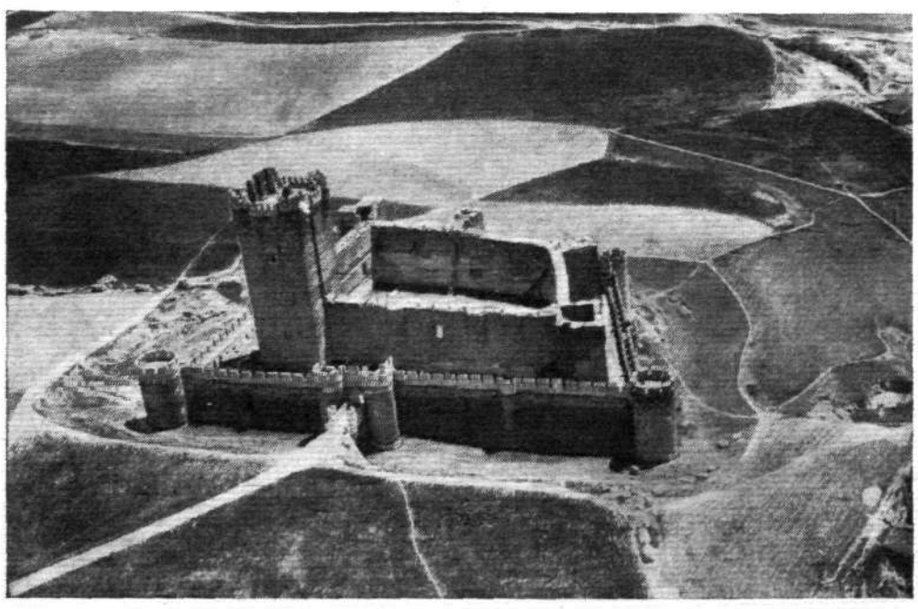
Flying a "Redwing" biplane (Siddeley "Genet IIa") with an endurance of 6¼ hours, Mrs. Keith Millar left Croydon on January 4 for the Cape. She is representing numerous firms, and intends landing at out-of-the-way places, both in Europe and Africa, to demonstrate their products. On the outward trip she will fly down the west coast of Africa, returning by the "All Red" route.

A Toffee Air Express

A K.L.M. freighter, rejoicing in the appropriate name of *Jumbo*, was recently chartered by a Dutch firm of confectioners and fully loaded at West Souburg aerodrome, near Flushing, with toffees. With about 1,000 kilos. of sweetmeats *Jumbo* flew to Schipol, Amsterdam, and it is thought that news of this flight has done a great deal to bring home the importance of air transport to the younger generation in Holland.

Durability

Imperial Airways machines which have just been stripped and thoroughly inspected after 4,600 hours' flying—equivalent to nearly half a million miles—have caused surprise by reason of their good condition. Close examination of the machines—H.P.42's—revealed that very little work was needed to put every part of the airframes in perfect condition; the only parts requiring attention under this head were the leading edges of the wings, where rain had penetrated. The fabric wing coverings had not been renewed or redoped during this time.



A SPANISH LANDMARK. An aerial view of the Castillo de la Mota at Valladolid—an excellent example of the mediæval methods of defence.

Every important achievement in the air during 1934

was accomplished with the help of

K·L·G

SPARKING PLUGS

Air Commodore Sir Charles Kingsford-Smith's flight across the Tasman Sea. (January 13th.)

◆

Paris-Tokio Flight by Mlle. Maryse Hilsz. (March.)

◆

Miss Jean Batten's Record Flight from England to Australia (May 8th-23rd.)

◆

Paris-New York Non-stop Flight by MM Codos and Rossi. (May 27th-28th.)

◆

King's Cup Air Race for the Thirteenth Successive Year won by Flt.-Lt. H. M. Schofield. (July 13th & 14th.)

◆

The MacRobertson Melbourne Air Race. The Winners (Mr. C. W. A. Scott and Mr. T. Campbell Black) and every British entrant relied on K.L.G's. (October 20th-23rd.)

◆

World's Air Speed Record 440.67 m.p.h. by Lieut. Agello of the Italian Air Force (October 23rd.)

◆

England-Melbourne-England in 13¼ Days by Lieut. Cathcart Jones and Mr. Ken Waller. (October 20th-November 2nd.)

◆

Fastest Speed Ever Attained by an Aeroplane 314 m.p.h. by M. Raymond Delmotte (December 25th.)

◆

K·L·G SPARKING PLUGS LIMITED, PUTNEY VALE LONDON, S.W.15 — PUTNEY 2671/4

THE FASTEST PLUG IN THE WORLD



Extract from Memorandum accompanying Air Estimates 1934 :—

"Coupled with such developments as the longer life of metal machines, and the extension of period between overhauls of both engines and aircraft, the necessary equipment for the new formations is being provided without any appreciable increase in the net amount of the vote."

The illustration above depicts a Squadron of Hawker aircraft—the machines which set a new standard.

Advt.

A YEAR OF PROGRESS

British Commercial Aviation during 1934 : Some Facts and Figures that will Surprise those who have not kept closely in Touch with Development

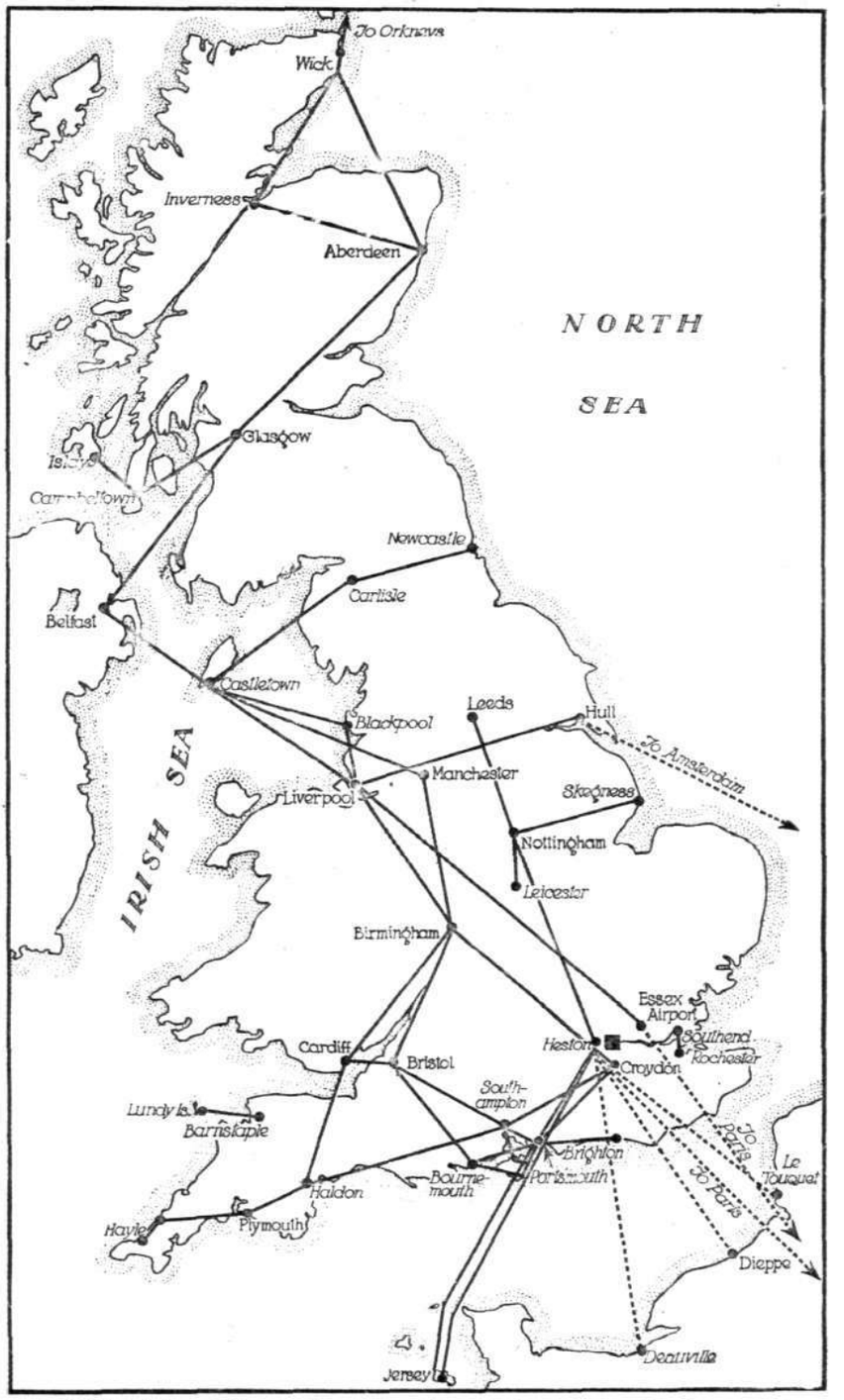
THERE is little doubt that the year 1934 will go down in history as the most important since man first flew, as far as the development of commercial aviation is concerned. Posterity will learn that by 1934 the general public, helped by the gradual appearance of a new generation to whom air travel was no new thing, had begun to look on it as a serious means of transport rather than as a perilous adventure; and operators, with the assistance of aircraft manufacturers, were finding it possible to run lines in this country without a subsidy and at a profit.

To deal first with internal air lines, at the end of 1933 there were a doubtful thirteen in this country; during last year some thirty-five routes were operated, and the great majority of these will be either reopened in the spring or have actually been running throughout the winter.

When the comparatively small size of the British Isles is considered and the extent and excellence of the railway and road transport system are remembered, the figure is surprisingly good. Save where a substantial sea crossing is made, the air-line operator is working at a very distinct disadvantage, for the ground organisation does not permit either scheduled night flying or operation in conditions of zero visibility. Our only beacons are on the Continental route—where, with D/F, they are hardly necessary—and hardly more than half a dozen aerodromes have night-landing or full radio equipment, though one or two shipping wireless stations can be used.

Nevertheless, the year's reliability figures have been surprisingly good on all lines—for which we have largely to thank the determination and skill of the pilots—and the fact has been conceded by the Post Office. After August 20 marked mail matter was carried by Railway Air Services on their Birmingham, Manchester, Isle of Man, Belfast, and Glasgow service, and for some time before, but experimentally, on Highland Airways' Orkney route. Again, on November 17, Sir Kingsley Wood announced that *all* mail would be sent by internal routes when such a course would expedite delivery, and the late Mr. Edward Hillman obtained the contract to Ireland and Scotland. Next year, in all probability, a number of other operators will have a chance of bidding for their particular areas.

One of last year's newcomers was Aberdeen Airways, Ltd., operating from Dyce under the control of Mr. E. L. Gandar Dower. On September 11 a twice-daily service to Glasgow, using a Short "Scion" and a D.H. "Dragon," was opened, and during the winter season this route is being covered on Wednesdays and Fridays when traffic justifies the trip. This year it is probable that Mr. Gandar Dower will run an East Coast service to London *via* Newcastle and Hull. Dyce, which is being rapidly developed, will be one of the finest airports in the provinces.



British "internal" air lines operating during 1934. Services to the Continent are also indicated, but the routes are shown dotted to avoid confusion. The "spider's web" effect, incidentally, is mute evidence of the need of greater co-operation between the various companies.

Using Ford Trimotors and a D.H. "Dragon," the British Air Navigation Co., Ltd., apart from their extensive charter work, have operated between Heston and Le Touquet, Deauville, and Dieppe, the second of the services being in the nature of an experiment. During the season 1,484 passengers were carried. In November B.A.N. Co. was granted a long lease of Brighton airport, to be opened in June.

From May 1 to September 1 Blackpool and West Coast Air Services, Ltd., carried no fewer than 3,762 passengers and some 40,000 lb. of newspapers on a twice-daily service between Liverpool, Blackpool, and the Isle of Man, using a D.H. "Dragon"—an increase of 100 per cent. on the 1933 figures. Regularity was 99.6 per cent., and a

daily service is being maintained throughout the winter. Mr. Gordon P. Olley, a pilot of very long experience, both with Imperial Airways and otherwise, is managing director of the company, and a lease of Ronaldsway (I.O.M.) has been obtained.

Although a Nottingham-Skegness service was run with a "Fox Moth" in 1933, very little has been heard of Eastern Air Services' longer 1934 service, which included Leicester. The trip was not made during the winter.

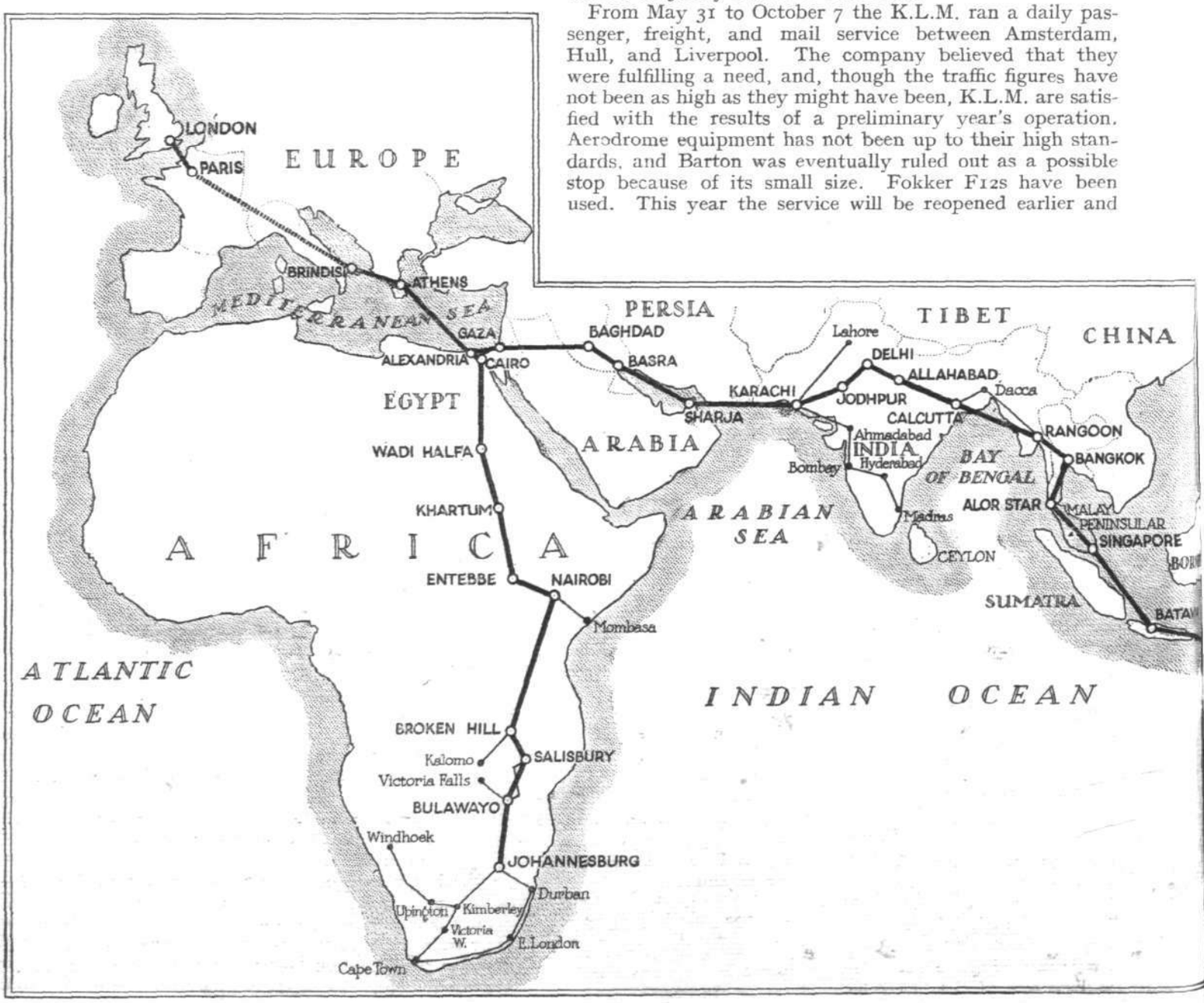
On May 28, 1933, Mr. E. E. Fresson started a service between Inverness and Orkney. On May 1, 1934, his company, Highland Airways, Ltd., opened a new service between Kirkwall and Thurso, and six days later Aberdeen was connected with the original Kirkwall service, on which 2,000 passengers had been carried in a little over eleven months. On May 29 Mr. Fresson was given the Royal Mail to carry between Inverness and Kirkwall; and on August 6 a twice-weekly service was opened between Kirkwall, Stronsay, Sanday, Westray, and North Ronaldsway. During the winter months the Orkney service is being run. A D.H. "Dragon" is doing most of the work.

Although Hillman's Airways, Ltd., concentrated last year on the markedly successful Paris service, on which an average of more than 150 passengers a week has been maintained, the late Mr. Hillman opened a daily service to Liverpool, the Isle of Man, and Belfast, when Mr. Sword's concern was wound up, and was the first operator to use the new Ards airport for Belfast. At the end of September this service was reduced to skeleton for the winter, but on November 17 it was announced that Hillman's had obtained the Irish and Scottish mail contract and that the service would be reopened on December 1. This year the company has been taking delivery of D.H. "Rapides," and these have been used on both the Paris and the Glasgow service. One was unfortunately lost in the Channel on October 2.

The Jersey Service

The rise to prominence of Jersey Airways, Ltd., though remarkable, might, perhaps, have been prophesied in view of the considerable saving of time. Started with a single "Dragon" between Portsmouth and St. Helier on December 18, 1933, the Heston-Portsmouth-Jersey service has been filling eight machines daily during the season, and six fully equipped D.H. 86s were ordered in November for this year's operations. Despite the difficulties caused by the fact that the beach is used as a landing ground at St. Helier, necessitating a continually changing time-table, 18,530 passengers were carried up to November 10, and even in the winter the weekly average has been in the region of 250. During the season an average of 4.5 passengers per trip was carried. In July a bi-weekly Paris service was run from Jersey, but this year the trip will be made to Rennes, an important railway junction for the north of France. From September 31 onwards a daily service to Jersey has been continued.

From May 31 to October 7 the K.L.M. ran a daily passenger, freight, and mail service between Amsterdam, Hull, and Liverpool. The company believed that they were fulfilling a need, and, though the traffic figures have not been as high as they might have been, K.L.M. are satisfied with the results of a preliminary year's operation. Aerodrome equipment has not been up to their high standards, and Barton was eventually ruled out as a possible stop because of its small size. Fokker F12s have been used. This year the service will be reopened earlier and



with a more convenient time-table, allowing good air connections with Central Europe. Hull will be a day's journey from Vienna.

In August a line was opened by a newly formed company, London, Scottish, and Provincial Airways, Ltd., between Leeds (Sherburn) and Paris, calling at Nottingham, and using Heston as a base. The return fare was £11 11s., and Airspeed "Couriers" were used. The line was fairly well supported—some eighty passengers a week were being carried in September—and was continued in experimental form during November and December when weather permitted.

From June 1 until the end of the season Messrs. R. T. Boyd and T. W. J. Nash ran an experimental service with a Monospar between Barnstaple (Heanton Court) and Lundy Island. The results have justified a regular service for this summer.

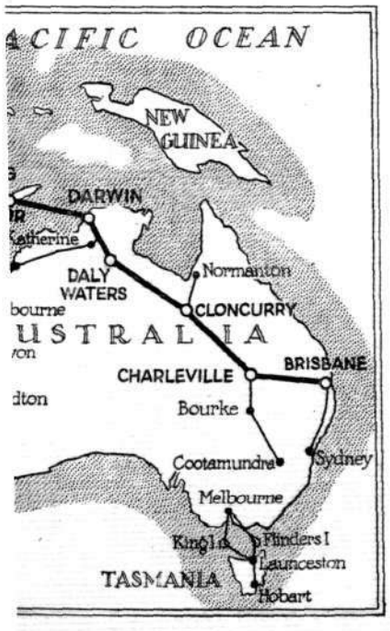
One of the Pioneers

Midland and Scottish Air Ferries, Ltd., which started operations with a Scottish West Coast service in 1933 under the management of Mr. John Sword, of road transport fame, was giving every indication of real usefulness when the company was suddenly closed down in July though the West Coast service was continued by Mr. Sword until September 30. The Glasgow-London service, which was opened by the Prime Minister and the Secretary of State for Air on April 6, was continued, as a London-Belfast service, by Hillman's Airways.

During December the Scottish West Coast (Glasgow-Campbelltown-Islay) service was taken over on three days a week by Mr. G. Nicholson, who had run a Newcastle-Carlisle-Isle of Man summer service.

Although the firm has been competing with a very excellent train service, Provincial Airways is developing a very fair connection, and traffic during the summer months has been promising. The route to Plymouth and beyond is a very good one, from the holiday sightseer's point of view, and the company have a "door-to-door" arrangement for passengers. Though inaugurated late in 1933, the Southampton, Haldon, and Plymouth service really opened on March 19, and, since July, has been operated with wireless-equipped D.H. "Dragons." A daily service is being persevered with during the winter months, and this year there are plans for a service to link the North.

One of the earliest air-line operators, Portsmouth, Southsea, and I.O.W. Aviation, Ltd., have had a successful third season, carrying well over twice the number of passengers transported in 1933. Last year's total, to September, was 39,211, of which 25,782 were carried on the short ferry service from Portsmouth to Ryde and Shanklin. On May 1 a Heston-I.O.W. service was opened with the old "Wessex" and a new "Dragon," and a new line also has been opened linking Brighton, Portsmouth, and Bournemouth—where Norman Edgar's line terminated—and Bournemouth with Shanklin. The fare on the Heston run has been identical with that for first-class surface travel.



Two and a half days to India and East Africa, four days to the Cape and to Singapore, seven days to Australia—these are the schedules promised for Britain's Empire routes, which follow the courses shown on this map.

The serious entry of the railway companies into air transport has probably done more than anything to give the general public the necessary faith. During 1933 a line was run by Imperial Airways for the G.W.R. between Plymouth and Birmingham, but it was not until April of last year that Railway Air Services, Ltd., was formed of five companies, one of which was Imperials.

On May 7 a line was opened to connect Plymouth, Haldon, Cardiff, Castle Bromwich, and Liverpool. D.H. "Dragons" were used, and at Cardiff, of course, the line was connected with Mr. Edgar's West of England services. On July 30 a twice-daily service was opened between Birmingham, Bristol, Southampton, and Cowes; and on August 20, one month after the Hillman service had been opened, the London, Belfast, and Glasgow line was started with wireless-equipped D.H. 86s (four "Gipsy Sixes"). Stops were made at Birmingham and Manchester (Barton), and R.A.S. were given the mail contract. As the machine would not, it was considered, operate satisfactorily from Ronaldsway aerodrome in the Isle of Man, a supplementary service, with "Dragons," was run between Barton and the Isle of Man to carry mails only. Between the opening and the end of September more than 600 passengers were carried.

By September all R.A.S. machines had been fitted with wireless, and on the 30th the Plymouth and Cowes services were shut down for the winter. The Glasgow service was continued with a new time-table which was again changed in November, when "Dragons" were being used for the Belfast-Glasgow run. On November 17 it was learnt that Hillman's Airways had obtained the mail contract.

A "Shuttle" Service

Using a Short "Scion" and a D.H. "Fox Moth," Southend Flying Services, Ltd., and Short Bros., Ltd., operated a high-frequency service last summer between Southend and Rochester. Five return trips were made daily in summer and two in the winter. The service, which is one of the few short-distance "shuttle" services in this country, started on June 11, and at the beginning of October some 1,200 trips had been made.

Another operating company which has passed its second season is Spartan Air Lines, Ltd. Last year they worked in conjunction with Railway Air Services, Ltd., and started, on May 1, a four-times-daily service between Croydon and Cowes. For the winter they were not supported by R.A.S., but carried on with a reduced time-table. The company has taken a considerable interest in the Channel Islands, and a Saro "Cloud" was flown there by Mr. Monk in the late summer.

Mr. Norman Edgar started operations in 1929 at Filton aerodrome. He used a "Fox Moth" for a Cardiff-Bristol shuttle service in 1932, and carried 1,000 passengers in 1933. Last year a D.H. "Dragon" was used, and an additional summer service run to Bournemouth until September 30, though the Cardiff ferry has been running through the winter. On July 20 the Bristol Tramways started a special bus service to Whitchurch, and gave booking-office facilities. Next year it is possible that Mr. Edgar will be turning his attentions farther afield. Lt. Col. D. B. Gray, O.B.E., M.C., has been a director of Norman Edgar (Wessex Airways), Ltd., since 1933.

It will be seen that internal and unsubsidised operation has increased very satisfactorily since 1933, and actually the route mileage has increased from 1,200 to 3,500 in approximate figures. At the same time, organisation has hardly moved to keep pace with the increase in traffic. A few new aerodromes have been licensed, and many others have been improved, but only Hull (Hedon), Portsmouth, and Belfast were equipped with wireless and D/F equipment.

Nevertheless, it would be difficult for even the most enthusiastic Air Ministry to decide which civil airports will attain the greatest importance, and this year we are promised better things. There is no reason why the mobile

Marconi stations should not be used where necessary. In addition, there were the older stations at Croydon, Lympne, Pulham, and Manchester to assist the operator, and the broadcasting station at Heston. The Air Ministry's own official weather broadcasting station is now at Cranwell.

Turning to services having the major portion of their routes outside the country, it is almost superfluous to dwell on the part which the London-Continental services of Imperial Airways have played in the progress of British civil aviation. Every one knows their reputation for safety, comfort, and regularity. Suffice it to say that the company, during 1934, has continued to develop its facilities in its usual eminently sound and sane manner, and that the number of passengers carried on the London-Paris service alone totalled 40,666.

Probably, like most pieces of machinery that work quietly and efficiently, these services have operated more or less unhonoured and unsung, at least by comparison with the same company's Empire routes, the sudden and inspiring developments in which have done more than anything else, with the possible exception of the Melbourne Race, to impress the value of air transport on ordinary men and women.

Of these Empire developments the year has produced two most important advances and one staggering promise. A species of flat rate, simplifying the work of the sender and thereby increasing the prospective weight of mail, has been introduced, and the long-awaited extension to Australia, albeit for mail only during the first few months of operation, has been opened.

A *Bright Future*

Those are the advances. The promise was made in the last month of the year. Within two or three years *all* mails will be carried to Empire destinations by air at the normal rates, and the services will be both faster and more frequent.

Meanwhile, Imperial travellers still "leave the ship" at Le Bourget and travel by train to Brindisi, but there seems every hope that this little political difficulty will be overcome before the end of 1935.

The possibilities of an Atlantic service are by no means as remote as they were. It has been announced during the year that a big trans-oceanic boat is to be built, and experiments to be made with a "composite aeroplane" in which one large machine takes another and faster machine designed for long-range, high-speed flight at high altitude into the air.

But that is anticipating. To return to the past year, ground organisation on the Empire route has steadily improved. Slow but sure development has brought wireless into its own, and direction-finding apparatus is now a matter of course at all important airports. "Homing" equipment has also been fitted to many machines on the Empire routes.

During April the Imperial services were slightly speeded-up, with the effect that India was reached in five days, Singapore in eight days, and Cape Town in nine days, the first accelerated service leaving Cape Town on April 10. Later in the same month it was announced that Qantas Empire Airways had obtained the Singapore-Brisbane mail contract, that Mr. C. A. Butler had obtained the Charleville-Cootamundra section, and that the MacRobertson-Miller Aviation Co. would carry the mails round the Australian west coast to Perth.

The first definite suggestions of striking changes were made by Sir Eric Geddes at the tenth ordinary meeting of Imperial Airways, Ltd. He spoke of duplicated services, new machines—including one for a possible Atlantic service—and higher speed. His speech paved the way for the startling announcements made in the House at the end of the year.

Mail Flat Rates

Then, in November, Sir Kingsley Wood announced that the varying postages over Empire routes would be adjusted to two flat rates of 6d. and 3d. In brief, letters to South and East Africa, India, and Malaya could be sent for the larger fee, and to Egypt and Persia for the smaller. On the 17th of the month the first flat-rate air mails were despatched, and a little later it was announced that this flat rate applied to the whole of India, where previously an extra fee was extracted from the unfortunate sender.

On December 8 a new chapter in air-mail history was opened with fitting ceremony. Lord Londonderry, the Secretary of State for Air, assisted by Sir Kingsley Wood and other notabilities, despatched the first all-air mail to Australia. The fee (1s. 3d.) appeared high, but a start had been made. Qantas Empire Airways was to take over the mail at Singapore, but, owing to an unfortunate accident, the hard-working "Atalantas" on the Far Eastern section were commissioned to take the mail through to Darwin on the first trip.

The following week's mail was of record weight, and services had to be duplicated all the way to Singapore.

Within Two Years

Then, on December 20, Sir Philip Sassoon, Under-Secretary of State for Air, made his far-reaching announcement on Empire air-mail services in the House of Commons. As he said, the scheme must be regarded as a basis for discussion only, but the ideal is expected to be a fact within two years. There is to be a very considerable improvement in time schedules on Empire services—two and a half days to India and East Africa, four days to the Cape and to Singapore, and seven days to Australia; provision is to be made for four or even five services a week to India, three to Singapore, and two to South Africa and Australia; letter fees are to be sent everywhere at a flat rate of approximately 1½d. per half-ounce.

So the year 1934 ended—on a note of almost extravagant hope.

NUTS TO CRACK—No. 2

Another "teaser" set by Flt. Lt. Nicholas Comper, A.F.R.Ae.S. The explanation will be published in an early issue, and in the meantime readers may care to send in their own solutions.

I REMEMBER two lads arriving in their R.E.8 on our aerodrome during the War, white-faced and astonished. This was the story told to me by one of them:

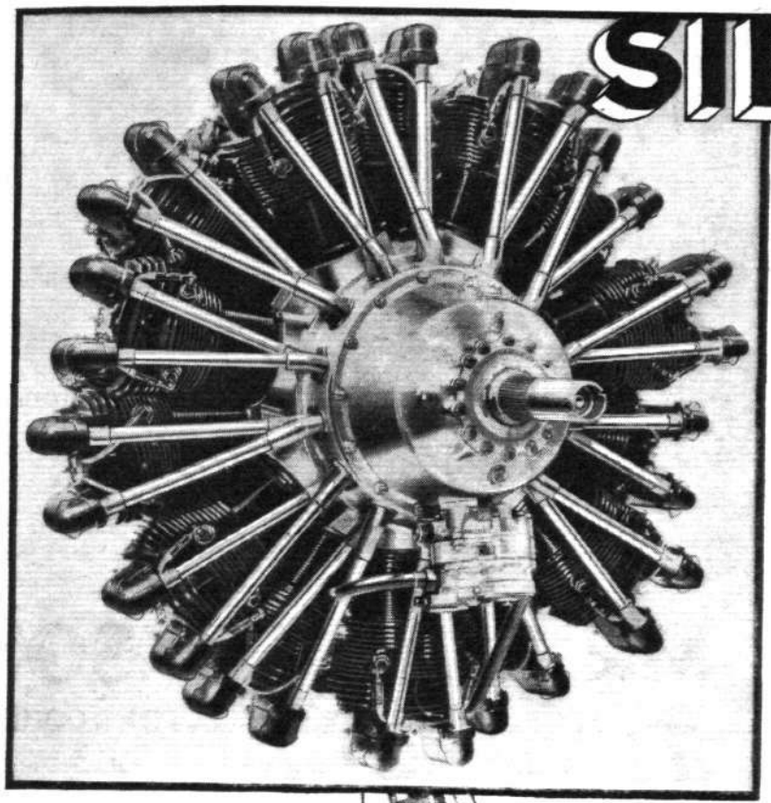
"We had just finished our 'shoot' and, after winding in our aerial, we were gliding down. We descended to about 3,000 feet, then suddenly, *crash!* If we had not been strapped in we would have jumped out of our skins and the aeroplane.

"The poor old R.E.8 bucked and started shaking itself to bits—or so it felt. I must have looked at the rev counter, for I remember noting mentally that, although the needle jumped with the rest of the aeroplane, there was no loss in power.

"But what shook me more than anything else was that we found ourselves sitting in a naked fuselage, or so it seemed, for all the fabric from engine cowl to tail had disappeared from one side! Still, the wings stayed on and we had control, which was more than had seemed likely a moment before.

"Throttle open or throttle shut, the vibration persisted."

There had been no explosion near the aeroplane. What had happened?



SIDDELEY

PANTHER ENGINE

LEADING DETAILS

Aircooled radial type. 14 cylinders. Moderately supercharged. Maximum flight power 625 h.p. at 6,700 ft. with a take-off power of 592 h.p. at sea level. The Panther engine is also available in a fully supercharged form.

A Panther engined Fairey Seal seaplane of the Fleet Arm being placed on its catapult aboard one of H.M.'s. battleships.



ARMSTRONG SIDDELEY MOTORS LTD., COVENTRY, ENGLAND



MR. S. A. JACKSON

WORKS MANAGER, SAMUEL FOX & CO. LTD.

Personally controls

CONDITIONS OF MANUFACTURE OF "DIAMET INSPECTED" STEELS. *He says—*

THE UNITED STEEL COMPANIES LTD

"When we first decided to build an entirely new type of high-frequency electric steel melting plant at Stocksbridge, and to devote it entirely to the manufacture of steels of uniform and dependable quality beyond the ordinary, I took a personal interest in every stage of the project.

Now that the plant is in operation, and we are actually making 'Diamet Inspected' Steels, I take it as a personal responsibility that every stage of manufacture is most carefully thought out to avoid any possibility of material getting through which is less than perfect.

I am pleased to say that my task is made easier by the enthusiasm of my staff and workpeople. Every single person in the works is as keen as possible to see that 'Diamet' material, when it leaves his hands, passes on to the next process with nothing left undone.

There is none of the 'Near enough, let it go!' spirit in handling 'DIAMET.'"

SAMUEL FOX & CO. LTD.

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S. A. Jackson.

'DIAMET *Inspected*'

DISC INSPECTED & METALLURGICALLY EXAMINED & TESTED MATERIAL

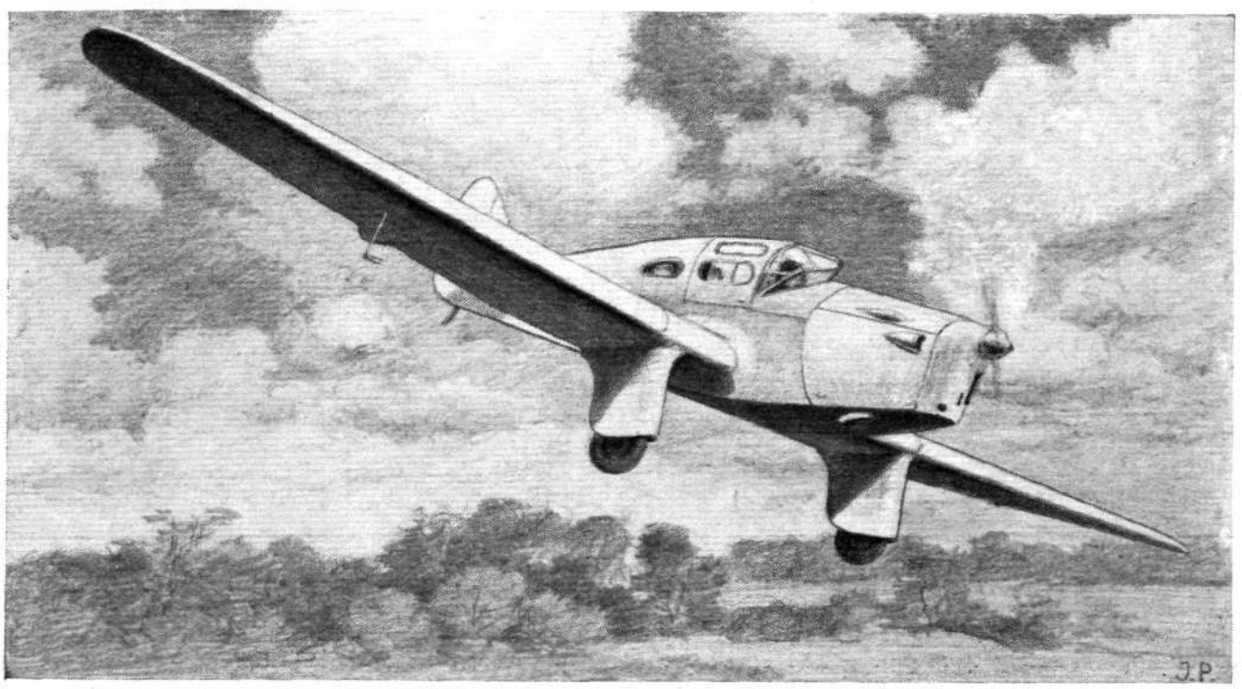
HIGH FREQUENCY ELECTRIC STEEL

DT3

Rowlinson-Broughton

IMPROVEMENTS in the "FALCON"

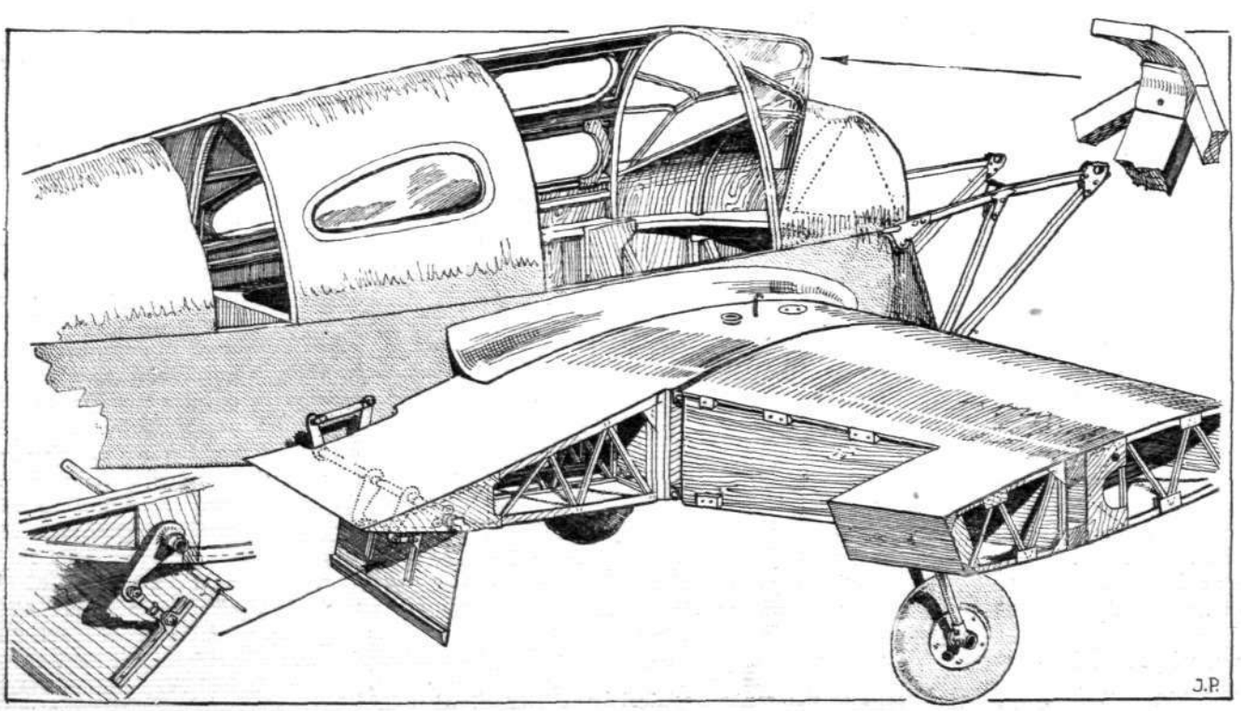
Some Interesting Alterations in a well-known Miles Product : An Unusual Windscreen Design, Enlarged Accommodation, and Neat Control Layout



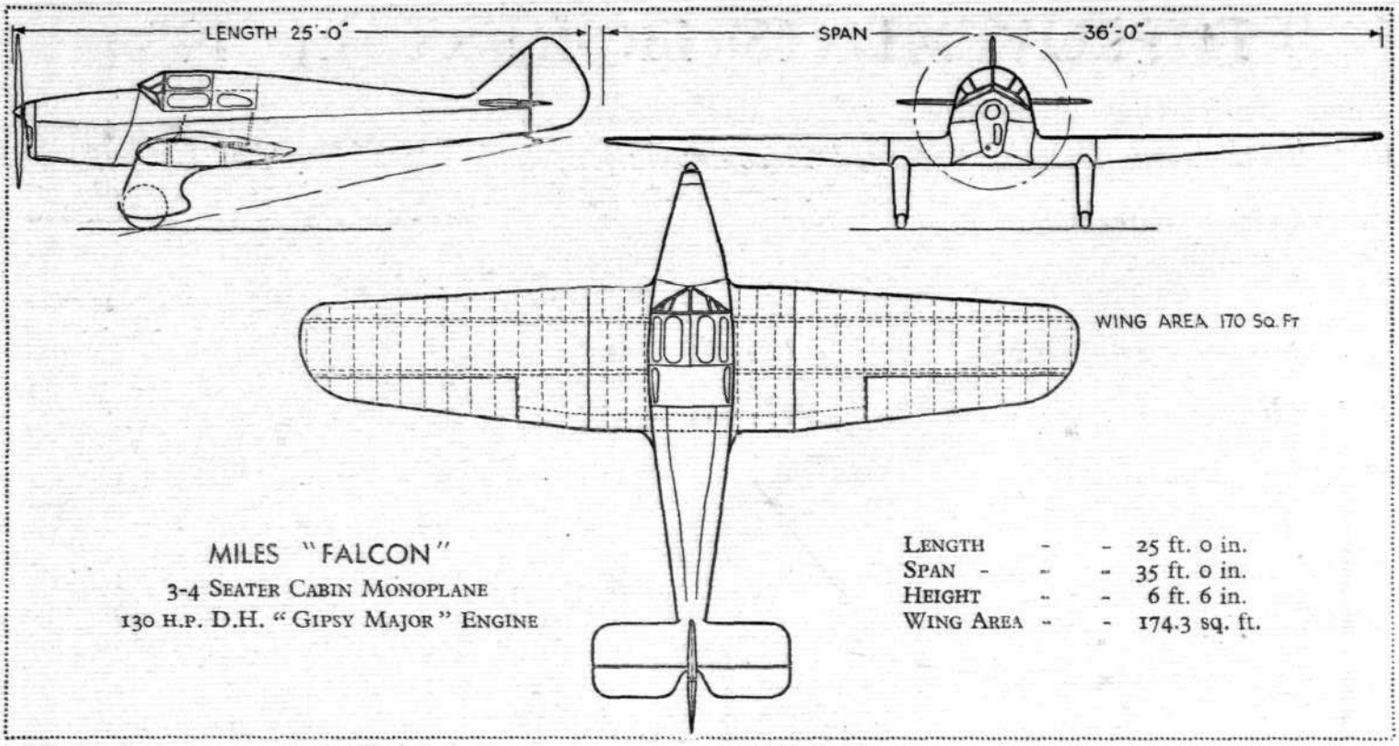
Our artist's impression of the new Miles "Falcon" ("Gipsy Major"), as it will look with its redesigned windscreen.

AT Mildenhall, on the morning of the England-Australia Race, the public saw the first four-seater to be produced by Phillips and Powis, Ltd., of Reading. This was the Miles "Falcon," which had been previously described in *Flight* for August 23, 1934. Since that time considerable alterations and improvements have been made to this model, and first details are published below.

A point which will first be noticed when this latest "Falcon" comes out of the factory—as it will do very shortly—is the new windscreen. Instead of the sloping screen characteristic of British design for many years



Structural details of the cabin, showing the formation of the windscreen. Part of the starboard wing flap is shown; the flaps are of the balanced type, with the centre balance portion operating forward, and thus in the opposite direction to the main flaps.



MILES "FALCON"
3-4 SEATER CABIN MONOPLANE
130 H.P. D.H. "GIPSY MAJOR" ENGINE

LENGTH	- -	25 ft. 0 in.
SPAN	- -	35 ft. 0 in.
HEIGHT	- -	6 ft. 6 in.
WING AREA	- -	174.3 sq. ft.

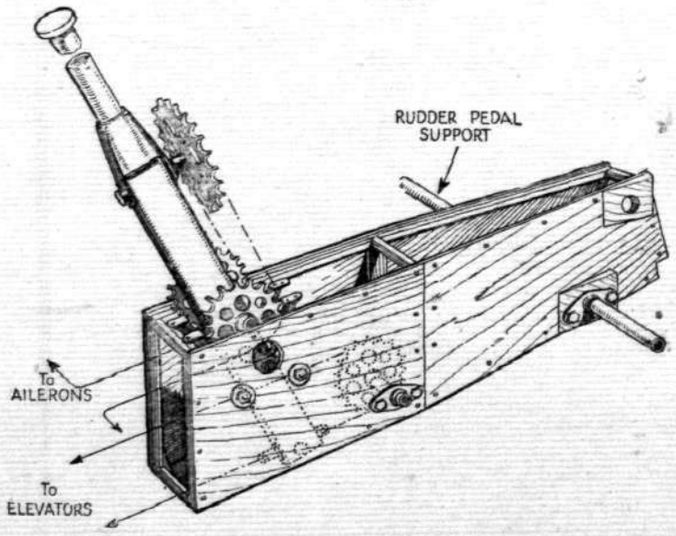
past, Mr. Miles now employs one which actually slopes forward. He has already tried out this design in "mock-up" form, with gratifying results and an increase of speed of approximately 4 m.p.h. The small front panes are at a sharp angle, and fine rain or snow should not collect upon them. The top part of the screen, over these panes, is of "Rhodoid," moulded to the correct shape. The general theory of this screen, as evolved in the United States on certain of the larger high-speed commercial air liners, is that the air in front of the screen is pushed forward and forms a cushion which tends to streamline all that part of the machine, so that the flow comes from the nose of the machine over the windscreen and flows aft, unbroken, behind it. With the sloping form of screen the air is shot steeply upwards over the screen, creating eddies above and behind it, thereby creating more drag than in the former case.

The internal arrangement of the "Falcon" has also been somewhat redesigned. It is now slightly wider and will provide extremely comfortable seating for four people. Dual control has been arranged in a neat manner which obviates the necessity for having two control columns or a change-over wheel type of control. This has been achieved by jointing the stick well above the bottom pivot, as is done in some military aircraft; reference to our sketches will show the details. An arm-rest will be arranged between the seats, thus allowing the pilot in the left-hand seat to fly with his right elbow on the rest, in which position the stick comes comfortably to his hand.

Very considerable interest has been aroused by this machine, and although at the time of writing it has not yet flown, several orders have been placed. It is hoped that the cruising speed will be in the neighbourhood of 125-130 m.p.h. with the "Gipsy Major" 130 h.p. engine. With the "Gipsy Six" which can be fitted if a smaller payload can be accepted, the performance will be substantially higher. The balanced flaps, which have already achieved such success in the "Hawk Major," will be used, and for the present, at any rate, their operation will be very much the same, though the question of hydraulic operation is under consideration.

All the "Hawk" series are substantially the same as regards their construction, that is to say, the spars are boxed up with spruce booms and plywood webs, and both the wings and fuselage are completely covered with plywood, which is secured to the appropriate members by glue. It will be remembered that in a description of the "Hawk" when it first came out, *Flight* commented very favourably upon the method by which Mr. Powis ensured perfect glueing while at the same time doing away with all pins or screws. This was by the use of a form of office "stapling" machine with the turn-over mechanism removed, so that the small wire staples, of the kind normally used for clamping sheets of paper together, were forced straight into the plywood and through to the member underneath. This can be done exceedingly quickly, and when the glue is dry the staples are removed.

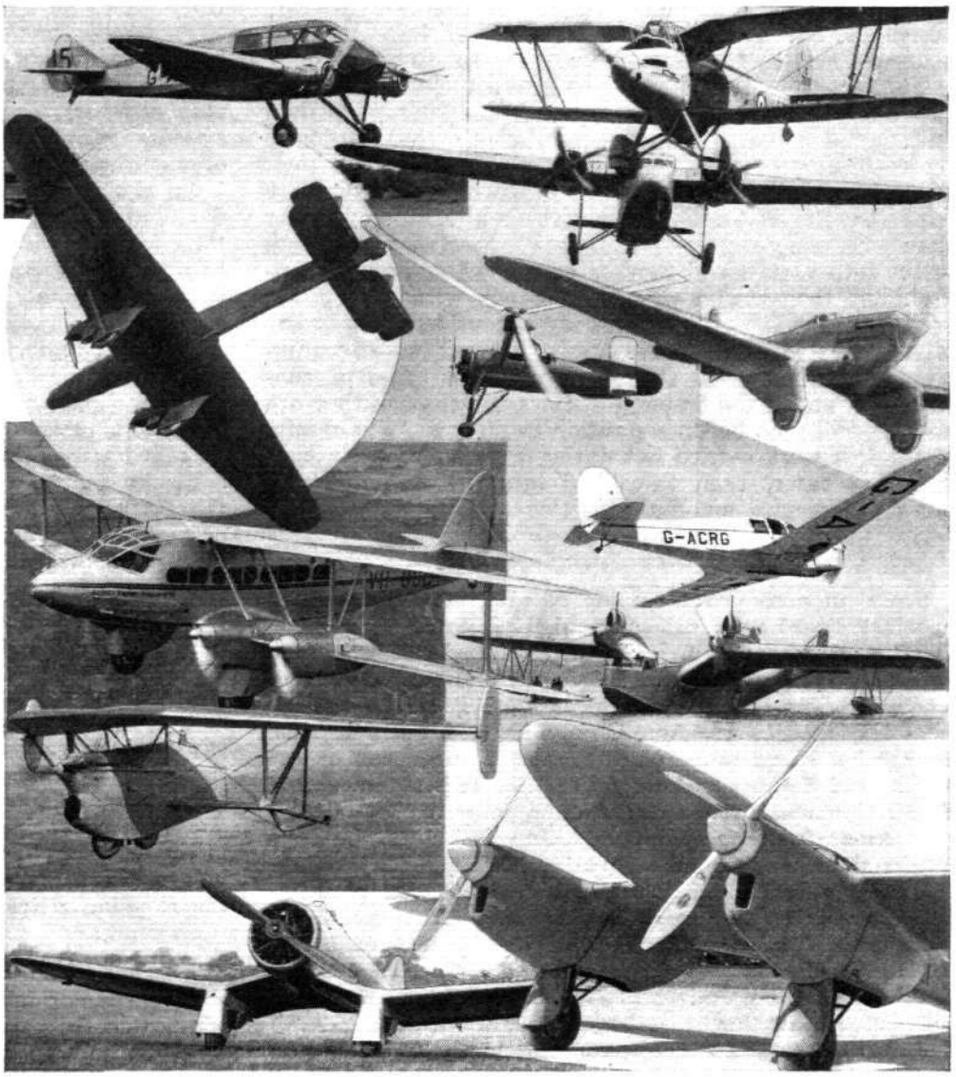
Mr. Miles believes in an adequate margin of strength, and his aircraft are, therefore, considerably stronger than the Air Ministry regulations require, so that for special circumstances a great deal more load can be carried. It is understood that this feature is being made use of in a subsequent type which will carry five people, and for which orders have already been accepted.



Details of the central control box, carrying the hinged control column and the support for the two pairs of pedals. Hingeing of the column in this manner provides full aileron movement without incommoding the passengers, although the column is between them.

TECHNICAL PROGRESS in 1934

British Constructors' Remarkable Diversity of Types : The Quest for Clean Aero-dynamic Design: Extending the Speed Range



Non-stop variety—some of the widely contrasted British types produced during 1934.

NEVER in the history of British aviation have constructors produced in one year so many aircraft types as those which made their appearance during 1934. Exact numbers are difficult to obtain, because in many cases there must of necessity be some doubt whether to class a certain aeroplane as a 1934 or a 1933 type, while in the case of military aircraft the actual year of production is not necessarily that in which illustrations and mention were first permitted to be published. Using a certain amount of discretion, one can, however, reasonably assess the number of new British aircraft types which first became generally known during 1934; the total is approximately fifty. An average of one new type per week is not a bad output for a relatively small industry, and seems to testify to a rather greater versatility among our designers than some would have us believe.

Adopting a rather arbitrary line of demarcation, one arrives at the result that out of the fifty new types produced about twenty were small civil types intended to appeal to the private owner; nine were larger types, ranging from the class that is rather too ambitious for the average private owner, through the "feeder line" category, and up to the machine suitable for operation on well-patronised air routes—a type, unfortunately, often referred to as an "air liner." Of new military types rather more than twenty were produced.

Biplane v. Monoplane

For a good many years the biplane *v.* monoplane struggle has continued, the former type, on the whole, holding its own rather longer in Great Britain than in some other countries. In the private owner class the monoplane has undoubtedly won the day during 1934. Subdividing still further, the low-wing cantilever monoplane has now become the most popular among the small machines, and has found adherents in the larger, twin-engined class.

If one looks for a reason, the low-wing monoplane arrangement probably owes its popularity to the relative ease with which aerodynamic cleanness can be achieved. The low placing of the thick wing brings two advantages not shared by any other wing placing. If a fixed undercarriage is used the distance from wing to ground is small, and the undercarriage legs can be made of low drag; if a retractile undercarriage is preferred, the thick wing affords a convenient housing for the wheels. There was a time when it was thought that the low-wing monoplane was inferior to the high-wing in aerodynamic efficiency. Modern research has shown this apparent inferiority to be due mainly to interference between the wing roots and the fuselage, and by using large "fillets" in the corners it is possible to reduce this interference.

Among the British military aircraft types the biplane still holds its own. Thoughtless critics have used this fact as a basis on which to accuse British designers of undue conservatism. The problem is not, however, one which can be solved satisfactorily by such off-hand methods as merely arguing that because a cantilever monoplane looks clean it is clean, or by pointing to a monoplane of some foreign make and draw attention to its great speed. In no branch of engineering is compromise more necessary than in aircraft design, and in no branch of aircraft design are the hands of the designer more tied than in the production of military types. Performance he must give if his design is to have any chance of being adopted. But he must also provide for carrying all the equipment which the various Air Ministry departments ask for, and he must see that this equipment is carried in convenient places where it is accessible. He further has to study the question of fighting view for the crew. And, finally, a decision has to be given on whether speed or climb and ceiling are the more important.

The monoplane single-seater fighter may be faster for a given engine power than the corresponding biplane, in which the undercarriage cannot readily be designed to

retract. But the monoplane will almost certainly be a great deal heavier. As rate of climb depends very largely on power loading and wing loading, it is likely that the biplane will in most cases outclimb the monoplane. Manœuvrability is another valuable feature in a military aeroplane, and here again the biplane with its short wing span and smaller moments of inertia is apt to score.

The fact that British designers generally have had more experience with girder and strip forms of construction than with metal *monocoque* and "metal-clad" construction is by no means the sole, nor even the main reason for their adherence to the biplane. The decision rests ultimately with the Royal Air Force, *via* the Air Ministry, rather than with the designers. If greater importance is placed, in the future, on speed than on climb, ceiling and manœuvrability, then the British designer will without a doubt produce what is wanted. Already a considerable number of the firms which produce military aircraft have accumulated experience with stressed metal skin types of construction, and if the demand justifies the change, they are now, or will soon be, in a position to meet it. The results of the test work carried out during 1934 have not, except in a few cases, been translated into actual aeroplanes, but the necessary foundation is there.

A Wider Speed Range

From an aerodynamic point of view, the year which has just closed was, perhaps, chiefly notable for the beginning of what is undoubtedly destined to become a general striving after speed range. In this connection it is worth recalling that in the International Touring Competition, organised by the Aero Club of Poland, one aeroplane achieved a speed range of 5 : 1, with a top speed of 158 m.p.h. and a slow speed of 33.6 m.p.h. It is not suggested that proportional results can be obtained with "practical" as distinct from special competition machines, but the results show what can be done.

During 1934 British designers aimed at good performance by taking care to reduce the number of avoidable excrescences on their machines. Engines were carefully cowled to give low drag without impairing the cooling. Wind screens were designed to interfere as little as possible with smooth air flow. Undercarriages were designed with their wheels enclosed in "spats," with wheels and struts encased in "trousers," or for retracting into the wings. Last, and not least, fillets were introduced in the angles between fuselage and wings to reduce interference. The result has been that the performance of the average civil machine has increased a great deal

One drawback this general "cleaning-up" has brought with it. The approach to the aerodrome before landing is likely to be rendered rather more difficult by the aerodynamic cleanness of the machines. No sooner is the nose of a very efficient aeroplane pointed downwards a little than the machine quickly gathers speed, and if the aerodrome is not a large one the machine is likely to reach the far side while still travelling fairly fast. It is then that the various devices for increasing drag and lift prove desirable. During the past year two main types of devices for increasing the lift have come into fairly extensive use; the Handley Page slot and slotted flaps, and the various types of "split" trailing-edge flaps. So far there is no unanimity about the relative merits of the various types, but during the present year the situation should become a little clearer, when more experience has accumulated.

Leaving for the moment the sphere of 'orthodox aircraft. the year 1934 saw the firm establishment of the autogiro type as a practical machine. Testimony to this fact was provided by the photographs published in last week's issue of *Flight* of fourteen autogiros ready for delivery to different countries. The Westland Aircraft Works have nearing completion a five-seater and a two-seater autogiro. but they will have to be treated as 1935 types. Another type in which the angle of incidence of the rotor blades is adjustable, is the Kay Gyroplane," the first test flights of which are now about to begin. The helicopter type did not make its appearance in England during last year, but the announcement was made that Mr. Robert Blackburn, one of the pioneers of British pilots and constructors, has interested himself in the Asboth helicopter, which is to be built in England during the present year.

From the Royal Air Force point of view the year has been a fairly satisfactory one so far as flying boats are concerned. Certain types have been ordered in considerable numbers, and several prototypes have made their appearance, all of which show great promise, and some of which will doubtless be put into production this year.

On the civil side the seaplane picture is less pleasing. Saunders-Roe have fitted different engines in some of their "Clouds," but of large new civil flying boats we have had none from any of the flying-boat firms. In view of the efforts made by other nations, it is to be regretted that a stronger policy has not been pursued by us.

The Mayo-Short "Composite" aircraft types, a large flying boat carrying a smaller landplane on its back until the operational height has been reached, when the smaller machine is released, offers fascinating possibilities, but can be called a 1934 *conception* only.

In the matter of engine development the decision of the British Air Ministry to change to fuels of higher (87) octane value resulted in a considerable increase in the power which could be taken from the engines fitted in military aircraft. Higher power ratings were adopted in many cases, and the benefit of these were seen in an improved aircraft performance. It is, perhaps, too early to judge whether the increased power has been attained without sacrifice in reliability, but the Air Ministry took so long over coming to a decision, and such very extensive experiments were made before that decision was reached, that one is justified in believing that the very remarkable reliability and long periods between overhauls for which British aero engines have become famous will not suffer in the least. While on the subject of fuel for aero engines, it is of interest to recall that during 1934 nine squadrons of the Royal Air Force used fuel made from coal.

Aero Engine Achievements

Of particular interest among 1934 aero engine achievements was the establishment of a world's altitude record of 28,000ft. with a Bristol "Phœnix" diesel engine in a Westland "Wapiti" aeroplane piloted by Mr. Penrose. Mention should also be made here of the introduction last year by the Bristol company of two sleeve-valve types, the "Aquila" and the "Perseus," of 15.6 and 24.8 litres capacity respectively.

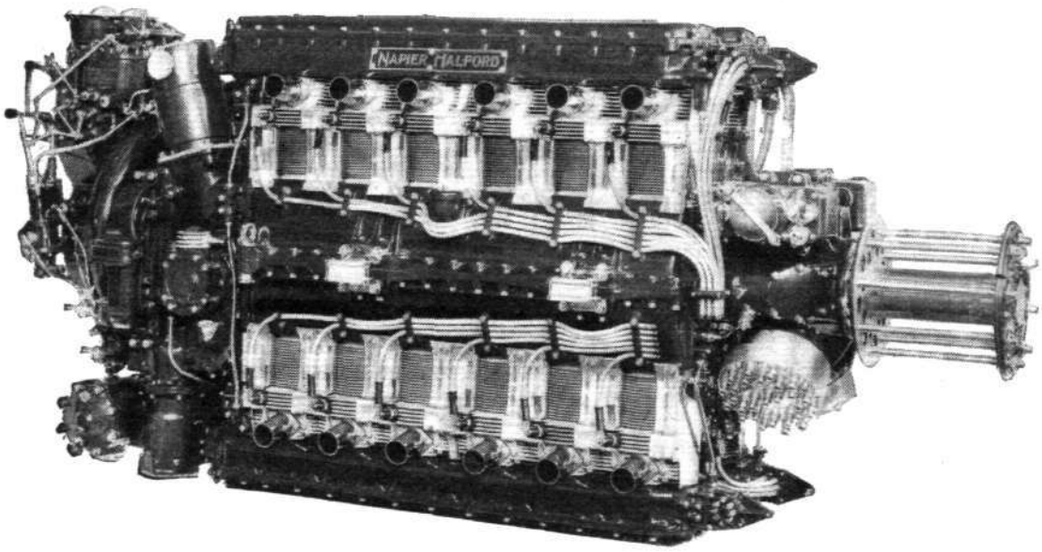
Of the Napier products the "Dagger" is, perhaps, the most remarkable of the engines developed last year. This engine is an "H" type, with 24 air-cooled cylinders in four banks of six each. The frontal area is remarkably small, and the engine develops a maximum of about 750 b.h.p. at a speed of 4,000 r.p.m., which is more than 40 h.p. per litre capacity.

The Rolls-Royce firm consolidated its position with more of its engines in service with the R.A.F. than can be claimed by any other firm. Taking advantage of the new fuels, the "Kestrels" were re-rated at higher power (620-680 b.h.p., according to type), while the "Buzzard" series has gone up to a maximum of 955 b.h.p. In addition the "Goshawk" evaporatively cooled types were developed to a considerable extent.

Perhaps the most important Armstrong-Siddeley types of 1934 were the "Panther" series VI and VII, and the "Tiger," series III and IV, of 540 h.p., 560 h.p., 610 h.p., and 700 h.p. respectively.

Pobjoy Airmotors introduced the 'Niagara," "Cataract," and "Cascade" 7-cylinder radial air-cooled types, of 90, 80 and 70 h.p. respectively, while the de Havilland company brought out the "Gipsy Six" of 200 h.p. and the racing version of it, which developed about 230 h.p. in the England-Australia Race. The Wolseley A.R.9, of 185 h.p., established itself during the year as a standard type.

Dagger



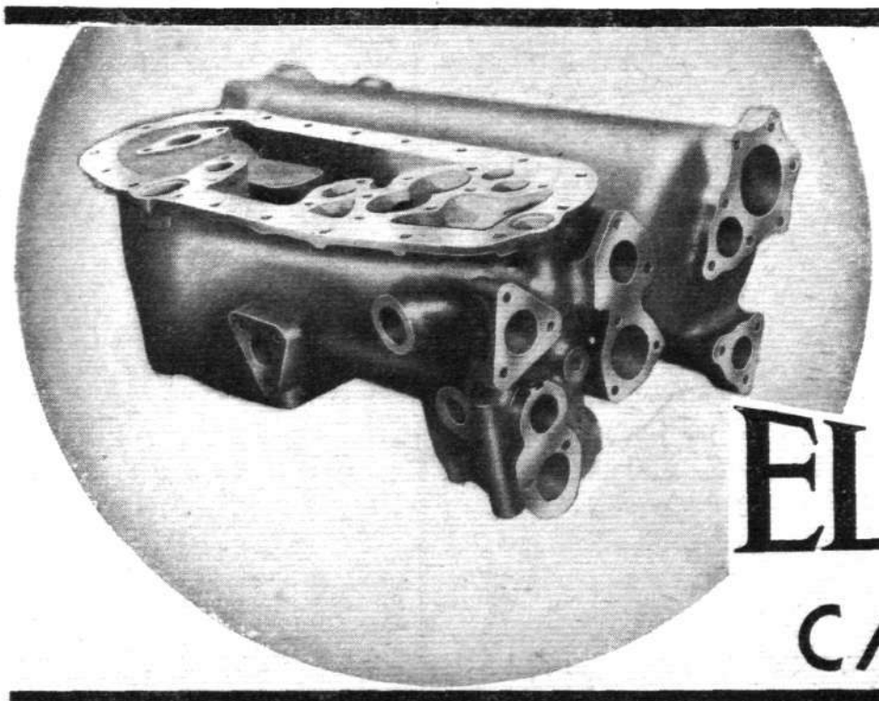
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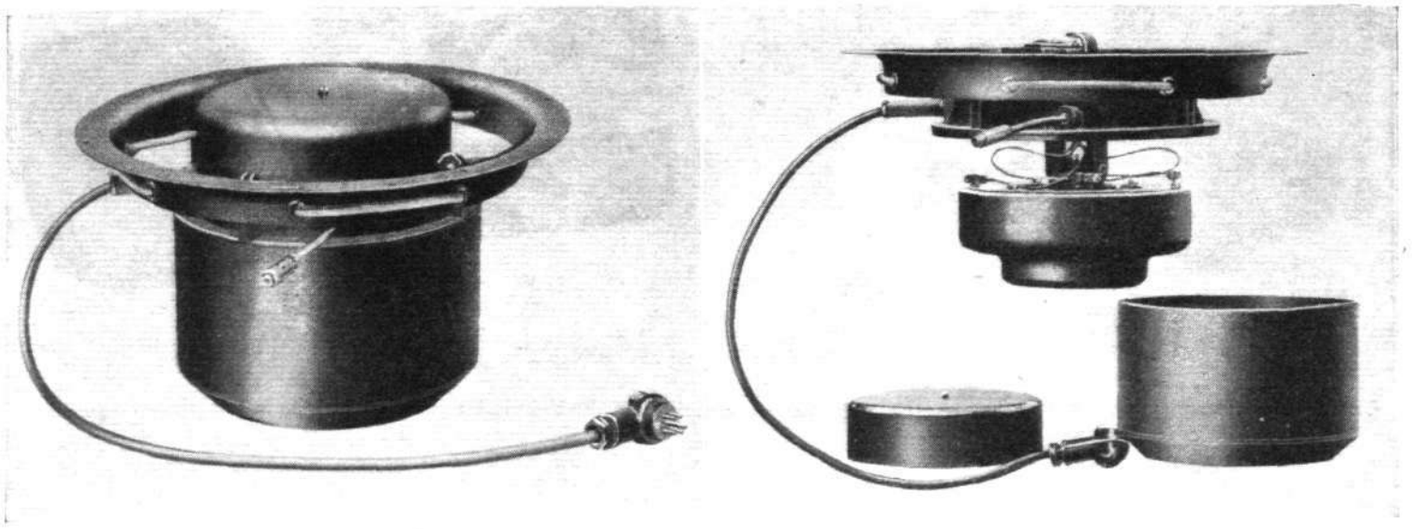


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A GERMAN "ROBOT" PILOT



The Tele-compass; on the right it is seen dismantled.

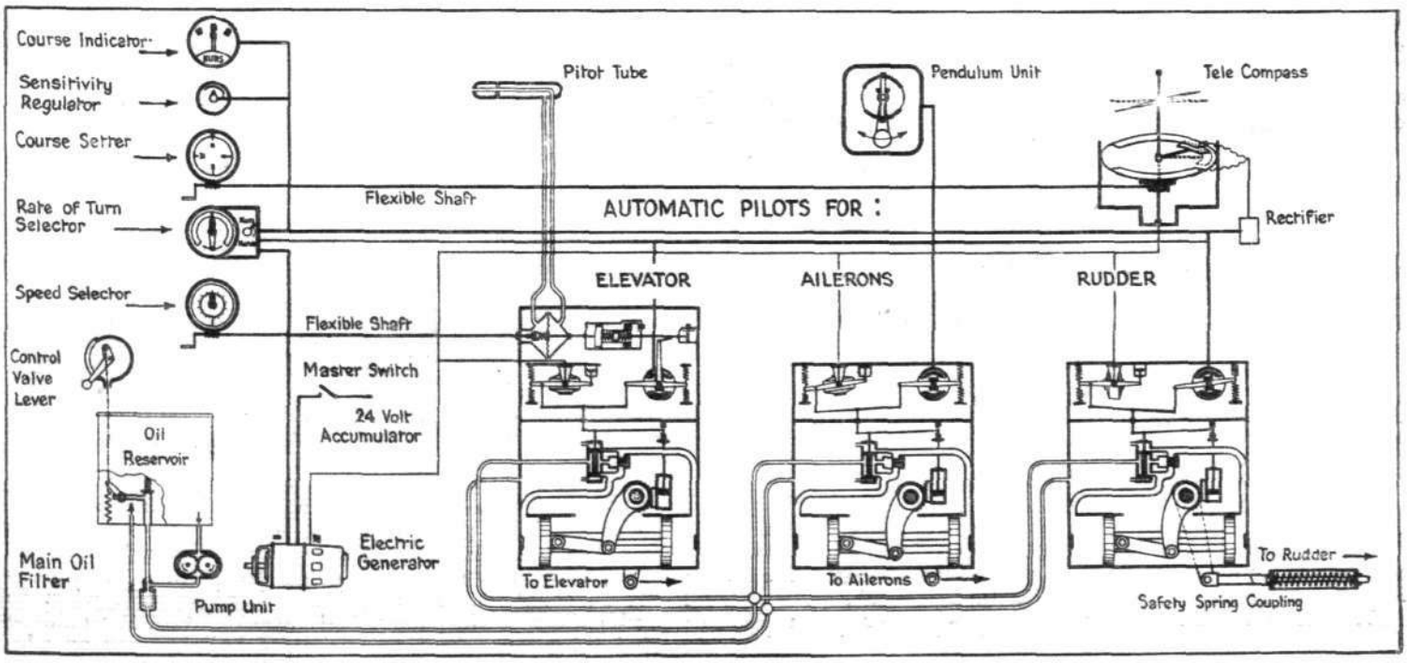
The Siemens "Autopilot": Remarkably Ingenious Electric-Hydraulic Operation System

HITHERTO a certain amount of secrecy has surrounded the details of the automatic pilot which the *Siemens Apparate und Maschinen* G.M.B.H., of Berlin, have been developing for several years. Some time ago it was announced in *Flight* that a German aeroplane fitted with this instrument had visited Croydon, but at the time details were not available. It has now become possible to describe and illustrate this interesting piece of modern equipment.

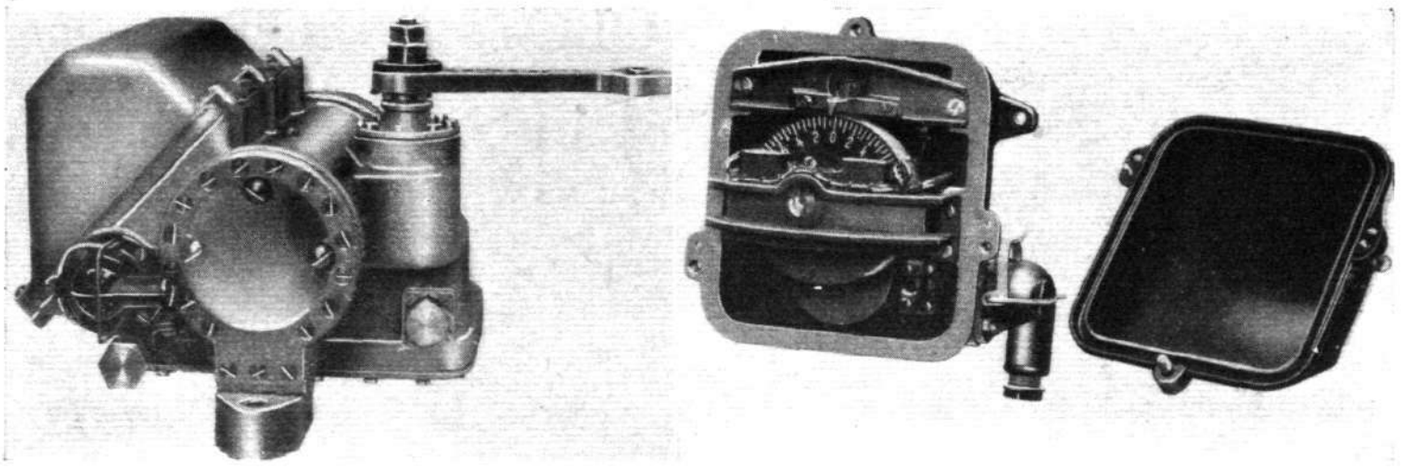
The Siemens "Autopilot" is designed to control the aircraft about all three axes. It differs from other automatic pilots in that, although gyroscopes are used, they are not the sole basis of the corrections applied by the working cylinders to the different control surfaces. For example, the rudder control is initially based upon the movements of a tele-compass mounted far back in the fuselage of the aircraft. Much in the same way, the elevator control receives its initial impulse from the pitot tube, the movements of the diaphragm of which are translated electrically into movements of the pistons of the working cylinder. Aileron control movement for correcting bank is initiated by a pendulum, the angular movement of which causes differences in current in the electrical circuit which, *via* a relay, starts the piston of the working cylinder moving.

In the rudder control the movements of the tele-compass are translated into control forces by the working cylinder *via* an electrolytic system. The float of the tele-compass rests in an electrically conductive fluid, the fixed and movable electrodes being formed by the compass bowl and float respectively. A resistance bridge ensures that a current proportional to the angular movement of the compass needles is produced.

Oil is the medium used in the working cylinders, which



This diagrammatic representation of the Siemens "Autopilot" shows the general operating principle.



One of the working cylinder units. The weight is approximately 30lb. On the right is the pendulum which initiates aileron control.

are of the double-acting type. The oil is under pressure (three atmospheres), and the pressure is applied to one side or the other of the piston by a special valve. The three working cylinders, for rudder, elevator, and ailerons, are substantially alike, and the principle upon which they work may be understood from a reference to the diagram. The system is thrown into gear or out of gear by closing and opening a short-circuiting valve in the main oil reservoir. Apart from the lever which controls this valve *via* a Bowden cable, the pilot has it in his power to switch off the electric supply, either by a master switch, which operates all three control systems, or by individual switches which switch off any, or all three, electric circuits. Furthermore, for emergency cases, when very quick action may be necessary, spring couplings in the control rods enable the pilot to over-ride the action of the automatic pilot. It will thus be seen that there is no reason to fear that the "robot" pilot will "take charge" uninvited.

Apart from the three controls already mentioned, which have for their object to keep the aircraft in rectilinear flight, there is also a unit which enables the aircraft to make turns of different radii, including very short turns in which a change-over of the control functions is carried out automatically. Turns as sharp as ten degrees per second can be made, and can be maintained whether the aircraft is in horizontal flight, gliding, or climbing.

It might have been thought that this would exhaust the possibilities of the Siemens "Autopilot." This is not, however, the case. In addition, an automatic engine speed control can be fitted independently of the "Autopilot." This consists of a small electric motor actuated by a special altimeter statoscope. Any variations in altitude are thus corrected. If altitude has been lost, this apparatus opens the throttle until the altitude for which the control has been set has again been reached. Conversely, if the aircraft climbs with the particular throttle setting and elevator control setting, the automatic apparatus closes the throttle until the desired altitude is reached.

To prevent ice formation on the pitot tube, with consequent failure of the elevator control, provision is made for heating with a 40-watt current.

During the development period the Siemens "Autopilot" has already been flown for some hundreds of hours, and it has been found that the sealed portions of the system can be counted upon to run for 100 hours without attention. After that they should be inspected by a specialist. No information is available concerning the degree of accuracy which the "Autopilot" will give in bumpy weather. On a calm day the rudder control will maintain the course to within ± 2 deg., the speed is kept within ± 1.9 m.p.h., and the altitude to within 1 mm. of mercury.

The one serious drawback to the "Autopilot" at present is its weight. This amounts to no less than 257 lb. The makers point out, however, that by fitting the apparatus there is no need to carry a second pilot, and that in calculating his weight one should take into account not only the weight of the man himself but also that of his equipment, parachute, dual controls, dual instruments, and so forth. It may be argued, against that, that a second pilot should be carried in any case, because the chief pilot might be taken ill, in which case the automatic pilot would not save the machine.

From a technical point of view, the Siemens "Autopilot" is extraordinarily interesting, and it is to be hoped that an arrangement may be made to demonstrate it at Croydon in the near future.

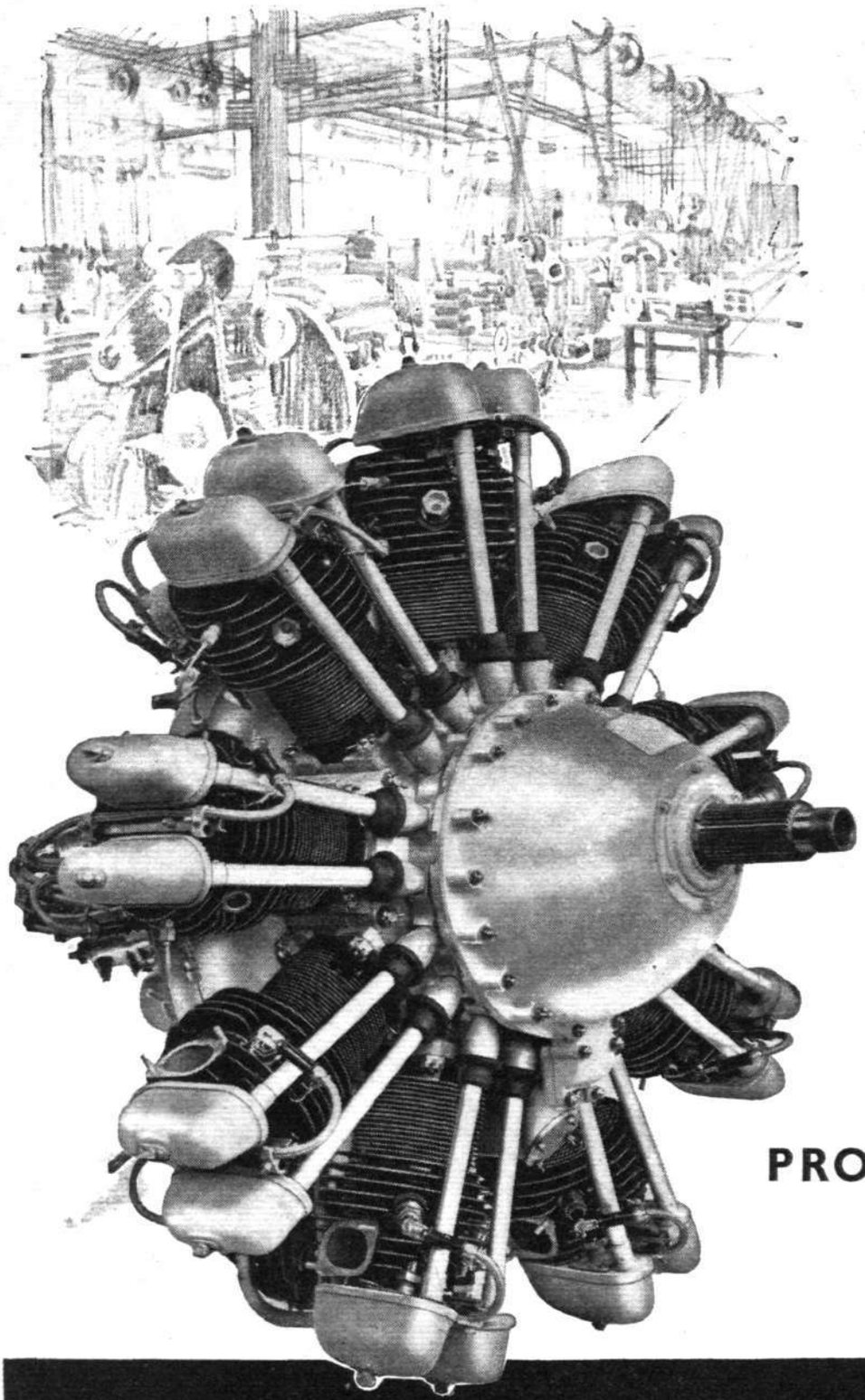
GLIDING IN INDIA

IN a talk broadcast recently in India, Mr. A. N. Moos, chairman of the Indian Gliding Association, made a strong appeal for Government recognition of, and support for, motorless flight in that country.

After giving a history of the science of gliding, Mr. Moos dealt with its development in India. He said that during the past ten years the progress made in Europe had been astounding, but it was not until 1931 that it was introduced to India by a private enthusiast, Mr. P. M. Kabali, who was the first Indian to attempt a solo flight by aeroplane to India. While in Europe taking his pilot's licence Mr. Kabali made a special study of gliding in Germany, and soon after his return to India he called a public meeting to inaugurate the Indian Gliding Association, which has headquarters in Bombay, and of which the D.C.A. in India is president.

Without any financial assistance whatever from the Government this organisation forged ahead and ordered three gliders, one from America and two from Germany, for the training of its members. In August, 1931, the Association was affiliated to the British Gliding Association. A training ground was procured in the hilly country of Aundh, about 200 miles distant from Bombay city. The Ruler of Aundh very kindly placed a large tract of ground at the disposal of the Association, and also provided, free of charge, the necessary hangars and a labour force. These arrangements were all completed by January, 1932, and in the first year of working eleven pilots were trained by the Association, which granted them "A" licences.

Mr. Moos said that steady progress had since been maintained, though they were badly handicapped by lack of funds. He mentioned the grant of £5,000 per annum for five years offered by the Air Ministry to the British Gliding Association, and cited the State support given to gliding in various European countries. He added that Lord Sempill, when he visited India last November, had suggested that it would be a good thing were the Government of India to pay an adequate subsidy to the Indian Gliding Association, particularly to enable it to improve its instructional courses.



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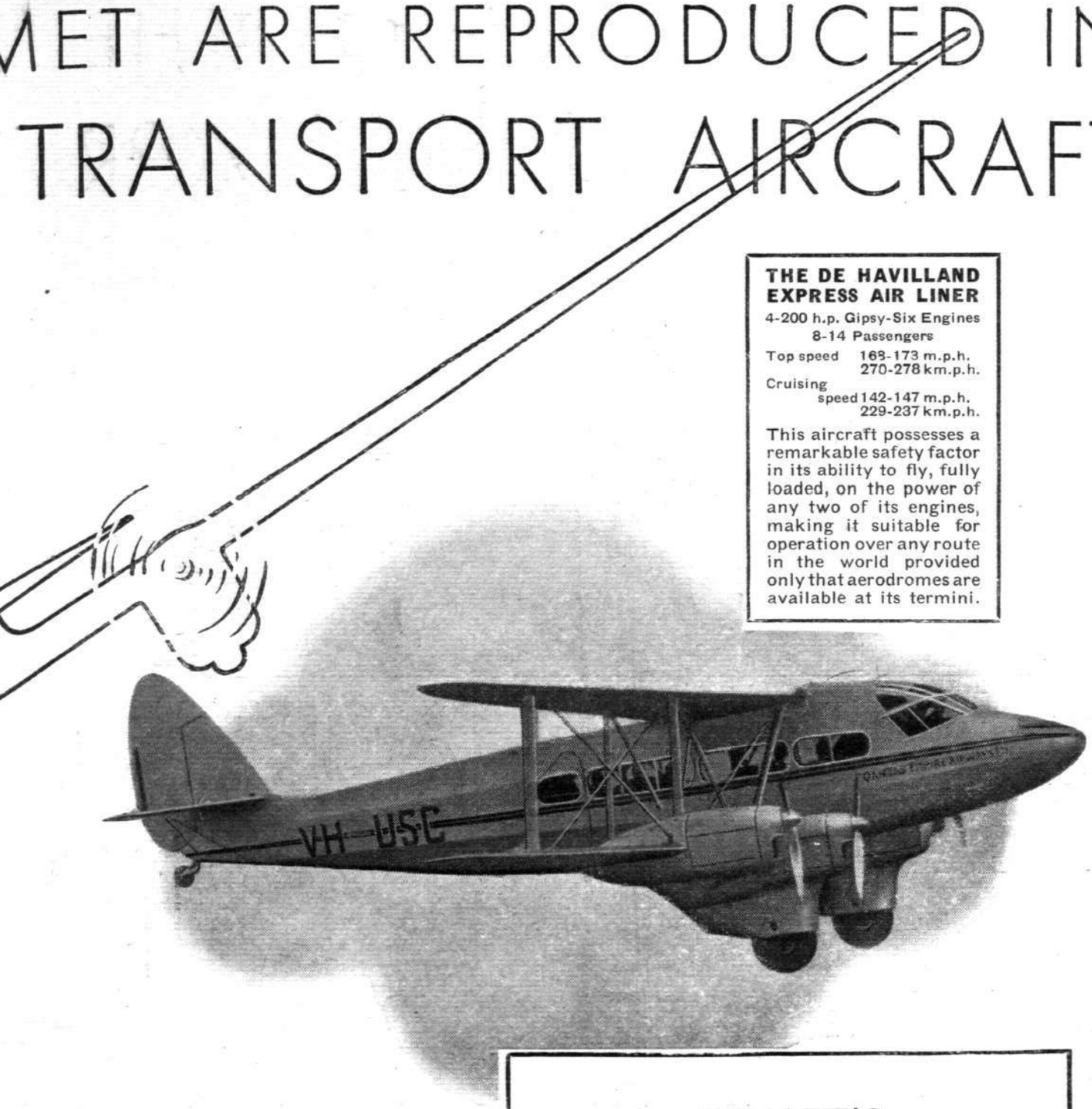
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THE R.A.F. and a YEAR of PROMISE

Service Activities During 1934: Important Re-equipment Moves: Aerodrome Developments: Some Noteworthy Long-distance Flights



(*Flight* Photograph.)

THE year 1934 was for the Royal Air Force a year of much promise and of some performance. The promises outweighed everything else in importance. First, the Air Estimates provided for raising three squadrons and two flights of the Fleet Air Arm during the year, in addition to converting the two paper squadrons at Martlesham Heath, Nos. 15 and 22 (Bomber) Squadrons, into real operational units. In a leading article on the Estimates *Flight* described this last move as "very clever," because it did not add to the number of our squadrons as reported to Geneva, but actually increased our warlike strength by twenty-four first-line bomber aircraft. No. 15 B.S. has been equipped with "Harts," and is stationed at Abingdon, while No. 22 B.S. has received "Vildebeests" and is stationed at Donibristle, where it comes under the command of the Coastal Area, although it is reckoned as part of the Home Defence Force. But No. 100 B.S. at Singapore is also reckoned as part of the same force.

The three new squadrons which were raised under the Estimates are No. 65 (Fighter) Squadron at Hornchurch, which flies the two-seater "Demon," No. 142 (Bomber) Squadron, flying "Harts," which was raised at Netheravon but is being moved to Andover, and No. 130 (Flying Boat) Squadron, which is at Pembroke Dock. The last-named is using "Southamptons" as a temporary measure, but is ultimately to receive the "Singapore 3."

Development Plans

The Air Estimates aroused only modified enthusiasm. It was generally felt that the time had come to pay less regard to the Geneva influence and to take some practical steps to increase our own security. The policy of disarming in the hope of persuading other nations to follow suit had obviously failed. Accordingly, in July, Mr. Baldwin announced a five years' plan, which provided for raising thirty-one new squadrons for the Home Defence Force and six new squadrons for the Fleet Air Arm and Overseas Commands over and above the new units sanctioned in the Estimates. This scheme presumably still holds the field except in so far as it was modified by the two years' plan announced at the end of November, which provided that twenty-two new squadrons for the Home Defence Force and three for the Fleet Air Arm should be raised by the end of 1936.

A fair amount of re-equipment of squadrons has been put in hand during the year. It has been decided to convert three Auxiliary squadrons (Nos. 600, City of London, 601, County of London, and 604, County of Middlesex) from bombers into fighters, and to give them "Demons" instead of "Harts" and "Wapitis." It has also been decided to give the Gloster "Gauntlet" to No. 19 (Fighter) Squadron, which is stationed at Duxford, in place of the "Bulldog." No. 8 B.S. at Aden is to have the "Vincent" instead of the Fairey IIIF, No. 30 B.S. at Mosul is to have the "Hardy" in place of the "Wapiti," No. 41 F.S. at Northolt is to have the "Demon" instead of the "Bulldog," No. 84 B.S. at Shaibah (the first squadron of all to receive the "Wapiti") is to get the "Vincent," No. 10 B.S. at Boscombe Down will exchange the "Virginia" for the "Heyford," and No. 205 (Flying Boat) Squadron at Singapore is to get the "Singapore III" in place of the "Southampton."

This last replacement is being made the occasion of an interesting flight, for No. 210 (F.B.) Squadron will fly the "Singapores" out and hand them over at Singapore, and will then fly the "Southamptons" back to England. On completion of the flight No. 210 F.B.S. will receive the "Scapa." No. 202 F.B.S., at Malta, is at last to receive flying boats instead of Fairey IIIF floatplanes, the new equipment being the "Scapa." No. 36 (Torpedo Bomber) Squadron at Singapore is to get the "Vildebeest" in place of the "Horsley." No. 209 F.B.S. at Mount Batten has received the "Perth" in place of the "Iris." Finally, No. 605 (County of Warwick) B.S. at Castle Bromwich is to exchange the "Wapiti" for the "Hart." This is a fairly satisfactory list of re-equipments, but it must be owned that most of the items belong to the category of promise rather than of performance.

Not very much can be said about new types chosen as standard equipment for the R.A.F., as most of the new selections have been in existence for over a year before receiving the full approval of the Air Ministry. They include the "Vincent," the "Scapa," the "Valentia" troop-carrier, the "Perth," the "Hendon," the "Overstrand," the "Shark," and the "Gauntlet."

There has been a certain amount of rearrangement of squadrons. Nos. 3 and 17 F.S. moved from Upavon to Kenley, as the former aerodrome has been handed over to the Coastal Area for the use of Fleet Air Arm units, and fighter squadrons obviously ought to be located in the inner ring of defence aerodromes round London. No. 111 F.S. has moved from Hornchurch to Northolt, No. 101 B.S. from Andover to Bicester, No. 33 B.S. from Bicester to Upper Heyford, No. 99 B.S. from Upper Heyford to Mildenhall, and No. 142 B.S. (as mentioned above) from Netheravon to Andover.

Mildenhall has been opened as a new aerodrome for heavy bombers. The Flying Training School at Digby has been

reopened, and the new buildings of Cranwell College were formally opened by Air Marshal (now Air Chief Marshal) H.R.H. the Prince of Wales.

It has been decided to move the Air Armament School from Eastchurch to the safer location of Manby, a new aerodrome in Norfolk.

The annual A.D.G.B. Exercises were held in July and concerned the defence of London. In August all three Services, Navy, Army and Air Force, combined in a landing exercise on the Holderness peninsula in Yorkshire, and in the autumn there were combined exercises in the North Sea and English Channel in which the Home Fleet and the Coastal Area took part.

In the spring the Middle East Command carried out a flight through East Africa by general purpose machines and "Victorias." The Far East Command organised a flight of some 4,000 miles by No. 205 F.B.S. from Singapore to Hong Kong and back, visiting North Borneo and the Philippines. No. 203 F.B.S. flew its "Rangoon" boats from Basra to Melbourne and back, to take part in the Victoria Centenary Celebrations. Four "Wapitis" of No. 1 (Indian) Wing, which comprises Nos. 27 and 60 B.S., flew from Risalpur to Singapore and back. As we go to press No. 11 B.S. ("Harts") accompanied by a "Victoria" is engaged on a squadron flight from Risalpur to Singapore

During the year the Under-secretary of State, Sir Philip Sassoon, started from this country in a "Singapore III" on a tour of inspection of Overseas Commands, and went as far east as Singapore.

During the year Air Vice-Marshal (now Air Marshal) Longmore relieved Air Marshal Sir Robert Clark-Hall in the command of the Coastal Area. Air Commodore C. T. Maclean took over the Near East Command from Air Vice-Marshal C. N. L. Newall, and Air Marshal Sir Edgar Ludlow-Hewitt has been selected for the Command in India next March.

Among other changes made during the year was the reorganisation of the R.A.F. Reserve. In future, commissions will not be given to new pilots unless they have held regular R.A.F. commissions or have passed through a University Air Squadron. Others will be enrolled as sergeant pilots.

The year saw the deaths of Sir Alexander Bannerman, who was the first commanding officer of the Air Battalion of the Royal Engineers, and of Air Vice-Marshal F. R. Scarlett, who had commanded the Coastal Area and who took the High Speed Flight to Venice for the Schneider Trophy of 1927.

During the year only thirty-one lives were lost in R.A.F. flying accidents, an average of one death to about 12,100 flying hours.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE ARCTIC ROUTE: MR. JOHN GRIERSON'S OPINION

[2993] I read with great interest the article "Transatlantic" written by your contributor "H. A. T." in *Flight* of December 20. He has certainly made a very good case for seadromes, but I wonder why, in discussing the Northern or Arctic Route, he chose Balbo's flight as an example. For, so far as I am aware, Balbo's wonderful performance was not in any way intended as an air-route flight. The whole object was to make a spectacular, world-wide demonstration of Italian nationalism, and as such it was an unqualified success.

The flights which really form the basis of all our knowledge concerning the Northern Route are those of the pioneer, Wolfgang von Gronan, and, at a later date, Charles Lindbergh. Eventually I hope that, when the report of my own humble efforts is published, there will be yet a third source of information.

In the meantime, no one can question the fact that Balbo's route was, from the point of view of weather on the hop from Reykjavik to Cartwright, the very worst possible. Obviously any air route would have to run to the north of this line, which almost coincides with that at which the cold Arctic currents mix violently with the warm southerly ones. In Balbo's case it was quite easy to string trawlers and battleships across the ocean, but, unfortunately, these facilities could not be arranged on the top of a block of ice 300 miles wide and 9,000ft. high. For that reason the Crociera Italiana shunned the uncertainties of the Greenland Ice Cap, and preferred to keep over the sea where, despite the likelihood of bad weather, they could at least be found after a forced landing.

I do not wish to discuss the results of my own findings in advance of my report, but I should just like to point out one thing about the Arctic Route which is often forgotten. As Britons we are inclined to think of the Northern Route simply as the natural air link between London and Ottawa, between the Old Country and her oldest Dominion. This is our own narrow view, but in America I found a much wider outlook. Pan American Airways actually employ on their staff a famous Arctic explorer because they believe that some day the Arctic regions will be traversed by a network of long-distance airlines, thus linking up places in the Northern Hemisphere by the shortest routes.

Therefore, even if seadromes do come to be employed successfully, do not let us forget entirely the potentialities of flying in the Arctic. Let us rather, as a great statesman said in reference to another matter, "think of the whole thing in ten years' time."

JOHN GRIERSON.

Richmond, Surrey.

IMPORTANT IRISH DEVELOPMENT

[2994] Relative to your recent news item on "Important Irish Development," your Irish correspondent is not strictly correct. I have been informed by the Secretary for Industry and Commerce, Dublin, that the Minister does not propose holding an enquiry into the development of civil aviation in the Irish Free State, but that he is willing to have the views of interested parties considered with that end in view. Also, I have never heard of any committee of enquiry into aviation ever having been held there, either by the present or previous administration in the Free State, but some years ago a local flying club got two capitation grants of £1,000 for the promotion of airmindedness there. This was afterwards withheld, as it was found that no useful purpose was served by the grant of further sums from public funds.

I am not concerned with the political relations of this country and those of the Irish Free State, but recent events go to show that no stone should be left unturned to develop friendly feeling, and in my view civil aviation can play a big part in this move. Anyone with a spark of horse-sense can see that Ireland has now a great opportunity to put herself into the picture, in view of projected plans for an Atlantic air route. Economically, she has a lot to gain by close co-operation with the principal air line operating from Croydon.

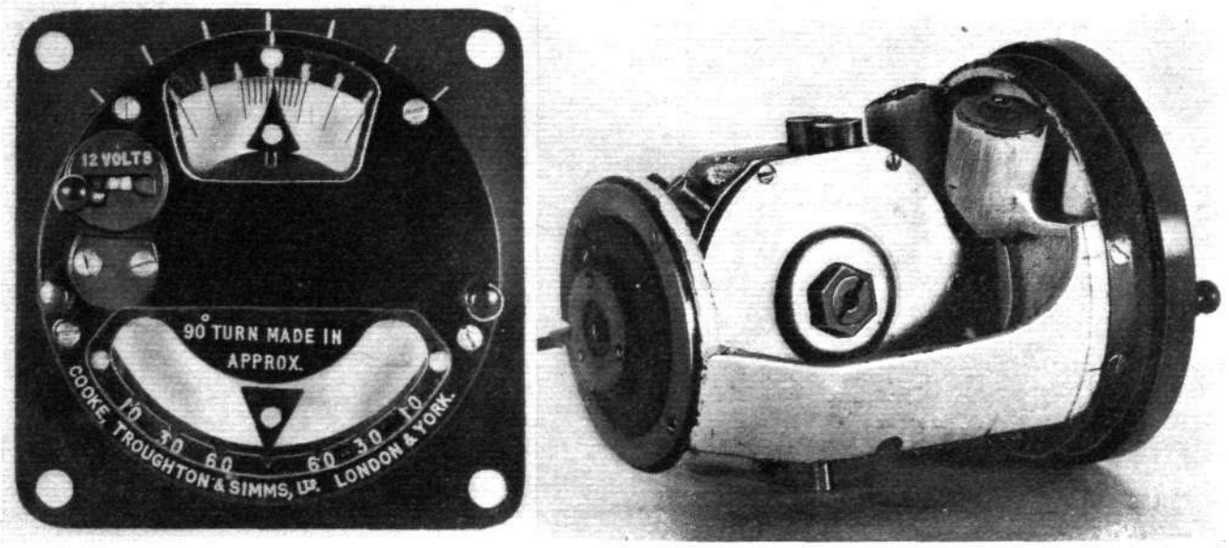
We are all anxious for internal services to be developed, but there is no place in civil aviation for mushroom concerns, which have neither the capital nor the organisation to prove worthy of Government recognition. Consequently the most useful course is for the Irish Free State Government to make a financial contribution and ask our principal concern to come in and help. Finally, I have already pointed out to that department that sooner or later she will find that her best interests lie not in the invitation of foreigners to operate and develop flying in Ireland, but that everything is to be gained and nothing to be lost by coming in boldly and asking whether she can enter the "field" or not, thus opening the avenues whereby knowledge can be gained to the benefit of all concerned. There is no benefit at present to be gained by the Free State diving into military aeronautics, using obsolete aircraft. There are no pilots there who have as yet had any experience of multi-engined aeroplanes, hence the open road is to curtail some of the vote on the Air Corps and concentrate in future on the civil side of aviation economically.

Lastly, it's better later than never to raise one's glass and drink to the hope that the spring of 1935 will see Dublin included in the projected air route plans now in hand.

Wallington, Surrey FRANK MURRAY.

A NEAT TURN INDICATOR

New Schilovsky Instrument : Quick Starting, Low Weight and Constant Speed



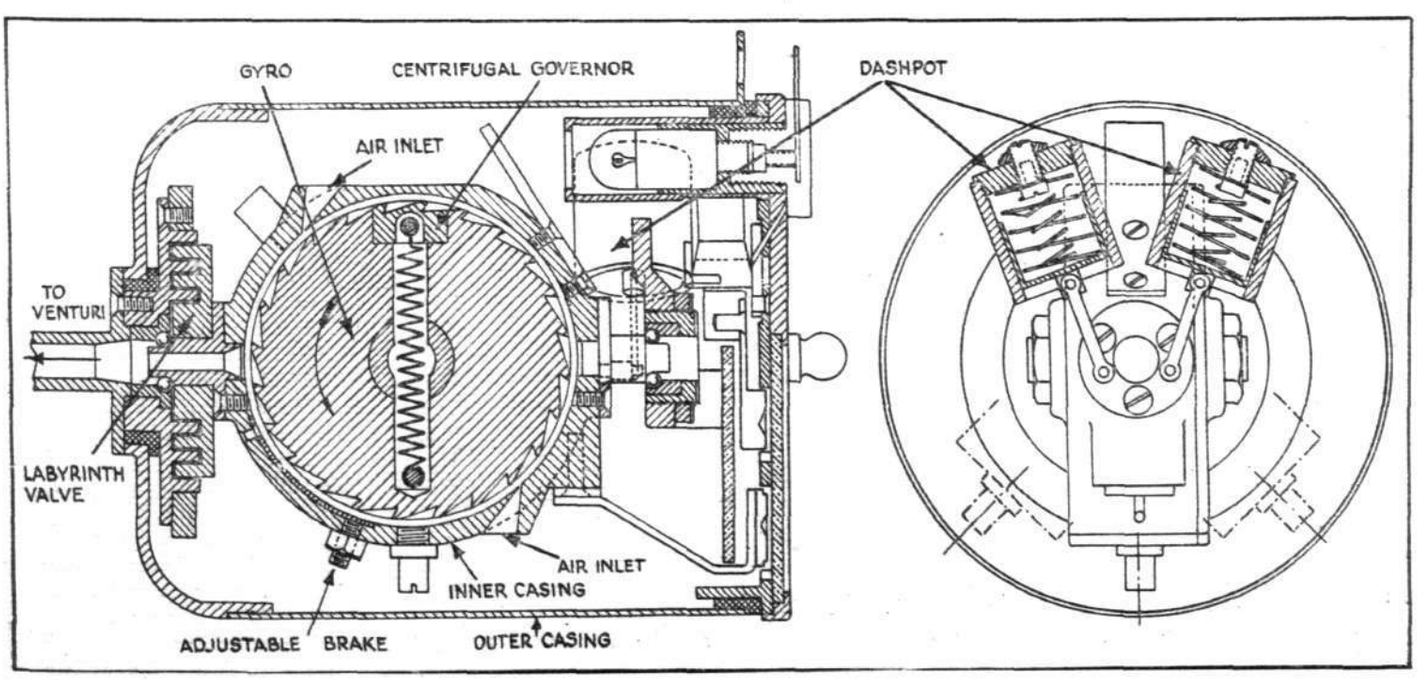
These photographs of the Schilovsky Rate of Turn Indicator are the actual size of the instrument. The upper pointer is the bank indicator.

FOR a considerable number of years Dr. P. Schilovsky has specialised in the design of gyroscopic apparatus, and he has now perfected a new Rate of Turn Indicator which marks a considerable step forward, in that its small size and low weight make it suitable for inclusion in the equipment of even the smallest of light aeroplanes. As was the case with the earlier model, the new instrument is being handled by Cooke, Troughton and Simms, Ltd., of York.

In addition to its small size and low weight, the new Schilovsky instrument has two very useful features in its design. First, it is truly a rate of turn indicator owing to the fact that it has been designed to give constant speed, so that the dial can be graduated quantitatively to show the angular rate of a turn. Secondly, owing to the low weight of the gyroscope, and to the new design, the full normal speed of 3,000 r.p.m. is reached in approximately 30 sec. This means that if the Venturi tube which drives the gyroscope is placed in the slipstream, the instrument will be in full working order while the aeroplane is still running along the ground during the take-off, a great advantage when starting in thick weather.

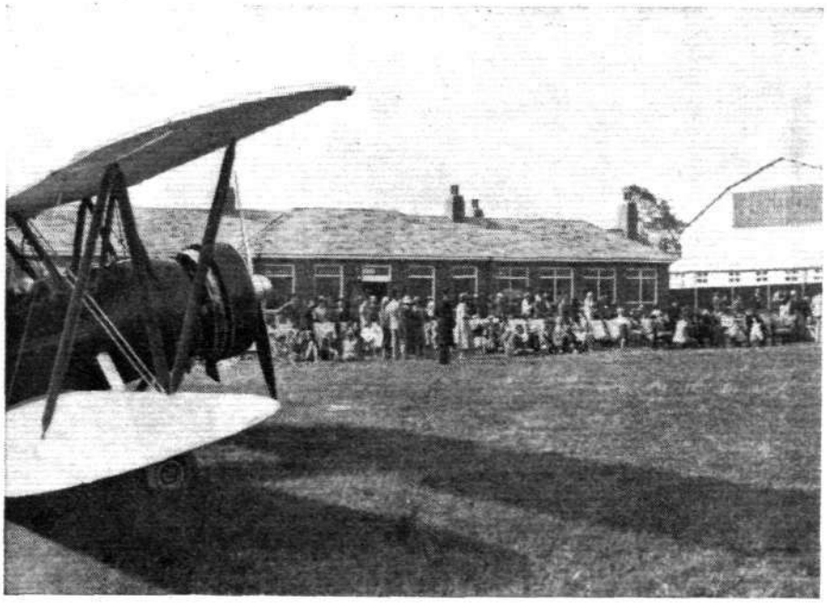
Dr. Schilovsky has obtained these interesting results by an ingenious design of the casing over the rotor. Instead of enclosing the entire instrument, the airtight casing encloses the gyroscope only, so that it contains but a very small quantity of air, the space being filled almost entirely by the gyroscope. As the casing swings with the gyroscope, the jets of air which drive the gyro by impinging upon the circumference always strike at exactly the same angle, thus tending to keep torque more constant. A neat type of centrifugal governor, in the form of a brake, prevents the speed from exceeding a certain figure, decided by the adjustment of the brake shoe against which the spring-loaded weight of the governor rubs. Hence the constant speed of the gyroscope. The principle is easily followed by reference to the drawings. After being tilted by a turn, the gyro is brought back to its central position by the two spring-loaded pistons.

The instrument weighs but 1 lb., and the gyroscope itself 3 oz. The photographs indicate the actual size.



The inner casing tilts with the gyroscope so that the air jets strike the "buckets" always at the same angle.

THE AMATEUR'S YEAR



Progress of Private Flying during the Past Twelve Months : Increases in Clubs' Membership : The Sport of Gliding

AN examination of the year's ownership figures might be a cause for depression if those for club flying had not increased so satisfactorily. Everything points to the fact that the enthusiasm is greater than ever, but that the operational costs and the troubles involved tend to deter pilots from actual ownership.

The comparative scarcity of aerodromes and the indifferent weather experienced in the British Isles reduce the value of an aircraft for serious use unless it is fully equipped and handled by an experienced—and that means "full-time"—pilot. The normal amateur does not feel justified in pushing through really bad weather unless he knows that his destination is clear and unless he has the reliability involved in a comparatively expensive twin-engined type.

If, therefore, he uses a machine only for summer and sporting flying, the amateur finds that it is less expensive and less troublesome to hire his craft either from a club or from a firm specialising in a "fly yourself" hire system. In these circumstances he has no responsibilities of maintenance or storage.

Nevertheless, there is little doubt that the provision of aerodromes for every town in this country would cause a very considerable increase in the number of machines owned by private persons.

Encouraging Efficiency

It has been found in previous years that a large number of people learn to fly, obtain their licences and then disappear from the movement, for one reason or another, before they have reached the really interesting stage of proficiency. Consequently, a number of clubs have, during the year, either instigated competitions for such things as navigation, blind flying, map-reading, aerobatics and forced landings, or have sectionised their flying members on a basis of efficiency so that those who have taken the trouble to learn all there is to be learnt have been allowed a greater freedom. Those in the "top class," in fact, have been permitted by their instructors to fly the club machines anywhere in this country or even to the Continent. For these blessings the members must also thank the insurance companies who have based their rates on the instructors' opinion of the pilots' proficiency.

No accurate figures are available for January 1, 1934, but on March 20, 477 machines were owned in this country by private individuals. In August the figure had risen to 556, and at the end of the year it was just short of 600. Not an astounding number, but the fact that the figure is rising, however slowly, is encouraging enough.

At the end of 1933 there were eighteen subsidised clubs with 2,500 flying members, and last year the figures had risen to thirty-two and 4,500 respectively. A few clubs show a decrease in the number of flying hours, but the majority, so far as can be gathered from the few statistics available, have to show slight increases. Some of these may be put down to a distinctly good flying summer, but the last few months of the year were probably worse from this point of view than those of 1933.

On March 19 Sir Philip Sassoon announced that the number of flying clubs in the subsidy scheme would be increased, and on July 20 the long-awaited Gorell Report was issued.

In general, the Report came to the conclusion that the airworthiness regulations had had a hampering influence, and that more rapid progress would be made if the whole subject of design and construction checking were handed over to an "air registration board." It was recommended that the Civil Aviation Directorate should be made as self-contained as possible, but that technical considerations precluded its transfer from the Air Ministry; that inventors should be allowed to try out experimental aircraft in safe areas without a C. of A.; that the system of aircraft documents should be revised and simplified; and that a system of compulsory third-party insurance for both power aircraft and gliders would be in the general interest of the community.

Night Flying Instruction

During the past year there has been a very distinct increase in the amount of night flying instruction given to amateurs. Several clubs have added it to their normal curriculum—which, incidentally, almost invariably includes a blind-flying course—and, though nocturnal instruction is necessarily expensive owing to the higher insurance premiums, there is very little doubt that the interest will increase.

There have been signs that the private owner will be demanding higher cruising speeds just as soon as these are compatible with safe landings in the comparatively small aerodromes found about the country. The advent of one flapped high-speed type forms the first straw to indicate the trend. Nevertheless, the private owner of an aeroplane remains as a highly skilled amateur and is not comparable in any way with the owner of a car.

After the initial rush of enthusiasm, when gliding clubs appeared all over the country, motorless flying had already settled down long before the start of 1934. The shortage of really good soaring sites within easy reach of the more populated areas had caused a certain amount of concentration of activity, but the leading club has had a successful year with a steadily increasing membership.

In July, the Government announced that gliding was to be subsidised at the rate of £5,000 a year for a period of five years. Sutton Bank had already been "earmarked" as the National Gliding Centre, and early in September the fifth soaring competition of the British Gliding Association was held there. During the meeting the British altitude and duration records were broken; the altitude figure turned out after investigation to be within 150 feet of the world's record!

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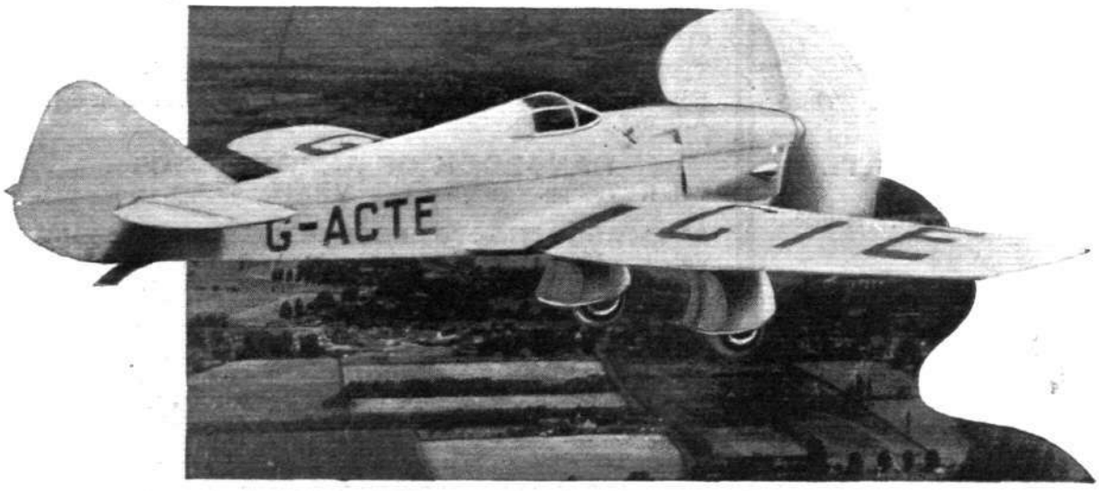
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THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

THE AIR COUNCIL—ADDITIONAL MEMBER APPOINTED

The Air Ministry announces:—

In view of the largely increased volume of work falling on the Air Ministry as a result of the recent decision of His Majesty's Government to effect an early expansion of the Royal Air Force, the Secretary of State for Air has decided to appoint an additional Member to the Air Council. As a result the Air Council will in future, like the Board of Admiralty and the Army Council, comprise four Service Members. The new Air Member will be responsible for the administration of the Directorates of Organisation, Equipment, and Works and Buildings.

Air Vice-Marshal C. L. N. Newall, C.B., C.M.G., C.B.E., A.M., has been selected to fill this new appointment, which he will take up with effect from January 14, 1935.

* * *

Air Vice-Marshal C. L. N. Newall entered the Army in 1905 as Second Lieut., Royal Warwickshire Regiment, transferred to the Indian Army in 1909, and joined the Royal Flying Corps in September, 1914. During the war he commanded a brigade of the Royal Flying Corps and Royal Air Force in France, and in addition to being awarded the Albert Medal for conspicuous gallantry in January, 1916, received the C.M.G. and C.B.E., was mentioned in despatches on three occasions, and had several foreign decorations conferred on him.

After the war, Air Vice-Marshal Newall served as Chief Staff Officer, South Eastern Area, and also held the post of Deputy Director of Personnel, Air Ministry. He was Aide-de-Camp to His Majesty the King during 1923-24, and after promotion to the rank of Air Commodore in January, 1925, was appointed Air Officer Commanding, Headquarters, Special Reserve and Auxiliary Air Force. Subsequently he was employed on special duty with the League of Nations Disarmament Committee, and on completion of this duty became Director of Operations and Intelligence, Air Ministry, and Deputy Chief of the Air Staff in April, 1926. He was appointed a Companion of the Order of the Bath in the Birthday Honours List, 1929, and in the New Year Honours List, 1930, was promoted to the rank of Air Vice-Marshal and made an additional member of the Air Council.

In February, 1931, he was appointed Air Officer Commanding, Wessex Bombing Area, Air Defence of Great Britain, and in October of the same year he became Air Officer Commanding, Royal Air Force, Middle East.

NO. 11 (BOMBER) SQUADRON'S FLIGHT

No. 11 (Bomber) Squadron, which is a unit of No. 2 (Indian) Wing, and is stationed at Risalpur, on the N.W. Frontier, is engaged in an inter-Command flight from its home station to Singapore, a distance of some 3,500 miles. All the twelve "Harts" of the squadron are taking part, and the baggage is carried in a "Victoria." The squadron started on Wednesday, January 2, and was due at Singapore on January 8. The Commanding Officer is Sqd. Ldr. C. F. le Poer Trench.

"SINGAPORES" FOR SINGAPORE

On Tuesday, January 15, four Short "Singapore mark III" flying boats (four "Kestrels") will start from Pembroke Dock to fly out to Singapore, where they will be handed over to No. 205 (F.B.) Squadron there. They will be flown out by the personnel of No. 210 (F.B.) Squadron, and Mr. Oswald Short will fly in one of the boats as far as Karachi. After handing over the "Singapores" to No. 205 (F.B.) Squadron, the pilots of No. 210 (F.B.) Squadron will take over the other squadron's time-honoured "Southamptons" and will fly them back to England. Thereafter No. 210 F.B.S. will be re-equipped with Supermarine "Scapas"

AIRCRAFT IN EAST INDIES

The first Hawker "Osprey" aircraft to be allocated to a ship on the East Indies Station arrived at the Trincomalee base recently in H.M.S. *Emerald* from England. At the moment it is the only aircraft of No. 406 Flight in service, as the other ships of the East Indies Squadron are without machines, but the flagship *Hawkins* is to be replaced shortly by the *Norfolk*, and in due course the *Enterprise* will return to the station after refit, when all three cruisers should be equipped with aircraft.

AN I.F.S. AIR CORPS RESERVE

Following the formation of an Irish Free State Volunteer Force as a reserve for the National Army, plans are now being considered by the Department of Defence for a means of creating a reserve of pilots for the Army Air Corps. Several schemes have been submitted, but the one which appears to be receiving the closest attention provides for the inauguration of a training establishment, somewhat similar to that operated by Air Service Training at Collinstown, County Dublin, a disused aerodrome. The memorandum setting out the proposals has already passed through the Department for Industry and Commerce, and is now being examined by the officials of the Director of Military Aviation at Army Headquarters, Dublin.



Air Vice-Marshal C. L. N. Newall, C.B., C.M.G., C.B.E., A.M., who has been chosen as fourth Member of the Air Council. (*Flight* Photograph).

No. 41 SQUADRON, R.F.C., AND No. 41 (F.) SQUADRON, R.A.F., DINNER

41 (F.) Squadron, R.A.F., annual reunion dinner will be held on Saturday, February 2, 1935. Any past member of the Squadron who has not received an invitation is asked to communicate with the present Commanding Officer of the Squadron, Sqd. Ldr. J. A. Boret, M.C., A.F.C. Letters should be addressed to him at No. 41 (Fighter Squadron, R.A.F.), Northolt, Ruislip, Middlesex.

AIRMAN PILOTS

It has been decided as a temporary measure to allow certain airman pilots to extend their flying service. Airmen whose selection for re-engagement is notified before they are due to remuster to their basic trades will continue to serve as pilots until, but not beyond, the expiration of their normal periods of flying service. The flying service of all other airmen who are mustered as pilots at the date of this order will be extended as follows:—(i) If not desirous of re-engagement—until the completion of their regular service. (ii) If desirous of re-engagement—until the receipt of the decision in the unit. Airmen who are selected for re-engagement will be remustered to their basic trades forthwith; those who are not selected will continue as pilots until the completion of their regular service. Any airman who does not wish his flying service to be extended is to intimate the fact to his C.O., who will then remuster him to his basic trade on the normal date.

NEW TRADE OF RIGGER (BALLOON)

A decision has been reached to abolish the group II trade of rigger (airship), which will be regarded as obsolescent from the date of this order. The trade will be replaced by a new group III trade of rigger (balloon), which will be recruited by selection from aircrafthands, group V. Airmen now mustered to the trade of rigger (airship) will continue to serve in group II until the expiry of their engagements. The decision to abolish that trade will not debar them from extension of service or from re-engagement. They will be considered for promotion on a common roster with riggers (balloon).

REPORTING THE MOVEMENTS OF CIVIL AIRCRAFT

In addition to the normal arrival and departure signals, the movements of civil aircraft using the R.A.F. Station, Abbotsinch, are to be reported by that station to the aerodrome control officer, Renfrew. Similarly, the movements of civil aircraft using Aldergrove are to be reported by that station to the aerodrome control officer, Newtownards. Aerodrome control officers at these civil air ports are responsible for initiating all action in connection with overdue civil aircraft.

ROYAL AIR FORCE GAZETTE

London Gazette, January 1, 1935

General Duties Branch

Air Vice-Marshal N. D. K. MacEwen, C.M.G., D.S.O., is placed on the half-pay list, scale A (Jan. 1); F/O. F. L. P. Henzell is placed on the half-pay list, scale B, from Dec. 17, 1934, to April 17 inclusive; Lt.-Com. L. G. Richardson, R.N., Flight Lt., R.A.F., ceases to be attached to the R.A.F. on return to Naval duty.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

The following Flying Officers are transferred from Class A to Class C:—F. P. Adams (Nov. 18, 1934); C. M. Rees (Dec. 15, 1934).

F/O. G. P. Moss is transferred from Class AA (ii) to Class C (Nov. 30, 1934).

AUXILIARY AIR FORCE

Stores Branch

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—Flt. Lt. F. J. B. Powell, M.B.E. (R.A.F. Retd.), is transferred from No. 600 (City of London) (Fighter) Squadron (Dec. 5, 1934).

TERRITORIAL ARMY

Anti-Aircraft Searchlight Companies

SURREY GROUP.—Maj. G. U. Morgan, O.B.E., A.M.I.Mech.E., is promoted Lieut. Colonel.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander (now Group Captain).—L. L. MacLean, to D.O.I., Dept. of Chief of the Air Staff, Air Ministry, 27.12.34, vice Air Commodore J. T. Babington, C.B.E., D.S.O.

Wing Commanders.—A. J. Capel, D.S.O., D.F.C., to Special Duty List, 21.12.34. Whilst seconded for duty as R.A.F. Instructor at the Staff College, Camberley, vice Wing Com. J. C. Slessor, M.C. G. R. A. Deacon, M.C., to Headquarters, R.A.F., Middle East, Cairo, 3.12.34. For Signals duties.

Squadron Leaders.—H. I. F. Beardsworth, to No. 5, Flying Training School, Sealand, 21.12.34. For duty as Chief Flying Instructor vice Sqd. Ldr. J. Oliver, A.F.C. R. J. Sanceau, to Record Office, Ruislip, 21.12.34; for Administrative duties, vice Sqd. Ldr. B. K. D. Robertson, A.F.C. C. A. Stevens, M.C., to Headquarters, Western Area, Andover, 21.12.34; for Air Staff duties vice Sqd. Ldr. W. F. Dickson, D.S.O., O.B.E., A.F.C. G. E. Gibbs, M.C., to No. 47 (B) Squadron, Khartoum, 27.11.34; to command vice Sqd. Ldr. A. MacGregor, M.B.E., D.F.C. A. MacGregor, M.B.E., D.F.C., to Headquarters, Palestine and Transjordan, 8.12.34; for Air Staff Intelligence duties vice Sqd. Ldr. F. H. E. Reeve.

Flight Lieutenants.—I. E. Brodie, to No. 41 (F) Squadron, Northolt, 21.12.34. G. Combe, to Armament Group, Eastchurch, 21.12.34. S. H. V. Harris, to Headquarters, Coastal Area, Lee-on-the-Solent, 21.12.34. R. G. Hart, M.C., to No. 9 (B) Squadron, Boscombe Down, 21.12.34. P. J. R. King, to No. 33 (B) Squadron, Upper Heyford, 21.12.34. A. H. H. MacDonald, to No. 35 (B) Squadron, Bircham Newton, 21.12.34. J. B. H. Rogers, to D. of O., Dept. of Chief of the Air Staff, Air Ministry, 21.12.34. O. B. Swain, to Headquarters, Western Area, Andover, 21.12.34. R. N. Waite, to Headquarters, Coastal Area, Lee-on-the-Solent, 21.12.34. M. C. Collins, to No. 230 (F.B.) Squadron, Pembroke Dock, 15.12.34. R. R. McL. Reid, D.F.C., to No. 20 (Army Co-operation) Squadron, Peshawar, India, 21.11.34. G. H. Shaw, to No. 39 (B) Squadron, Risalpur, India, 26.11.34.

Flying Officers.—G. Bearne, to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 20.12.34. M. F. Calder, to No. 3 (F) Squadron, Kenley, 24.12.34. A. N. Luxmoore, to No. 43 (F) Squadron, Tangmere, 17.12.34. B. A. Fraser, to Headquarters, Aden Command, 6.12.34. K. W. Goudie, to No. 26 (Army Co-operation) Squadron, Catterick, 23.12.34. F. W. Yates, to No. 216 (B.T.) Squadron, Heliopolis, Egypt, 3.12.34.

Pilot Officers.—W. T. King, to No. 31 (Army Co-operation) Squadron, Quetta, India, 18.12.34. J. S. Leslie, to No. 39 (B) Squadron, Risalpur, India, 18.12.34. H. M. T. Neugebauer, to No. 28 (Army Co-operation) Squadron, Amabala, India, 18.12.34.

Acting Pilot Officer.—C. N. Swann, to R.A.F. Balloon Centre, Rollestone, 15.12.34.

Stores Branch

Squadron Leader.—W. J. King, D.C.M., to Headquarters, Air Defence of Great Britain, Uxbridge, 28.12.34; for Equipment (Stores) Staff duties vice Sqd. Ldr. A. W. Smith.

Flight Lieutenants.—M. F. Tomkins, to Marine Aircraft Experimental Establishment, Felixstowe, 20.12.34. F. C. C. B. Hichens, to R.A.F. Depot, Middle East, Aboukir, 7.12.34. J. E. R. Sowman, to No. 47 (B) Squadron, Khartoum, 12.12.34.

Flying Officers.—E. J. Bradbury, to Aircraft Depot, India, Karachi, 18.12.34. T. King, to School of Store Accounting and Storekeeping, Cranwell, 3.12.34. H. E. Freeston, to Station Headquarters, Upper Heyford, 28.12.34. A. Wall, to No. 1 Stores Depot, Kidbrooke, 21.12.34.

Accountant Branch

Flight Lieutenants.—C. L. Dook, to Station Headquarters, Netheravon, 21.12.34. W. E. V. Richards, to Headquarters, R.A.F., Middle East, Cairo, 9.12.34.

Flying Officer.—W. J. R. Cann, to No. 47 (B) Squadron, Khartoum, 5.12.34.

Chaplains Branch

Rev. J. H. P. Still, M.A., to R.A.F. Depot, Middle East, Aboukir, 7.12.34; for duty as Chaplain (C. of E.) vice Rev. C. P. N. Rowband, M.A.

Diary of Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

Jan. 14. "Aerodrome Design." Lecture by Sir Leopold H. Savile, before the Institute of Transport (Inst. Electrical Engineers, Victoria Embankment, London, W.C.2).

Jan. 29. Newcastle-on-Tyne Aero Club Annual Dinner and Dance, Barras Bridge Assembly Rooms, Newcastle-on-Tyne.

Feb 4. Jubilee Celebration of the Foundation of the City and Guilds College, Imperial College of Science and Technology.

Feb. 8. "Ice Formation in Carburetters." R.Ae.S. Lecture by Mr. L. P. Coombes.

Feb. 15. Annual Aviation Ball, Bristol and Wessex Aeroplane Club, Grand Spar Hotel, Clifton.

Mar. 1. "Fuels for Aircraft Engines." R.Ae.S Lecture by Mr. E. L. Bass.

Mar 5. "Problems of Cold Presswork." Joint R.Ae.S. and Inst. A.E. Lecture by Dr. H. Gough and Dr. Desch.

Mar 15. "New Developments of the Autogiro." R.Ae.S. Lecture by Senor Juan de la Cierva.

Mar. 29. "Piloting Commercial Aircraft." R.Ae.S. Lecture by Sqd. Ldr. H. G. Brackley.

Apr. 12. "Commercial Aircraft." R.Ae.S. Lecture by Capt. G. de Havilland.

May (Date not yet fixed). Wilbur Wright Lecture, R.Ae.S., by Mr. W. D. Douglas.

NOTABLE FLIGHTS IN 1934

A Review of Some Achievements that have Helped to Make Aeronautical History

WHILE few of the noteworthy flights made during 1934 were of a spectacular nature, there were many meritorious examples of what might be termed "utility" flights.

Perhaps the outstanding flight of the year, apart from Messrs. Scott and Black's victorious journey in the Melbourne Race, was the remarkable out-and-home journey between England and Australia by Lt. O. Cathcart Jones and Mr. Ken Waller in the D.H. "Comet" which they flew in the Race. The outward journey from Mildenhall to Melbourne—the actual participation in the Race—was accomplished, on October 20-25, in 4 days, 22 hours, 29 minutes, and the return journey, on October 27-November 2, in 5 days, 15 hours, 23 minutes. The 23,000 miles there and back was completed in just under a fortnight!

Ordinary flights between England and Australia still found a few enthusiasts, but not so many as in previous years. An unofficial record was established in October by the young Australian pilot Mr. James Melrose, who flew his D.H. "Puss Moth" ("Gipsy Major")—in which he subsequently took part in the "great race"—from Darwin to Croydon in 8 days 9 hours. Melrose, by the way, had previously (in August) made a remarkable flight round Australia (from Adelaide) in his "Puss Moth," taking 5 days 11 hours for the 8,000 miles and beating Mr. H. Broadbent's previous "record" by about two days.

Two other noteworthy flights to "down under" fell to the fair sex. Miss Jean Batten, a young New Zealand pilot, set out to fly home in her "Gipsy II Moth," and, after two unsuccessful attempts, succeeded, during May, in accomplishing the journey from Lympne to Darwin in 14 days 23 hours 25 minutes, thus beating Mrs. Mollison's time for the same trip. Miss Freda Thompson, a 22-year-old Australian girl, also decided to fly home, leaving Lympne in her D.H. "Moth" ("Gipsy Major") on September 28. She was not intending to beat "records," and after a delay in Greece from slight damage to her machine, reached Darwin on November 10.

Surveying the Race Route

Another England-Australia flight was that of Messrs. Bernard Rubin and Ken Waller, who left Lympne in March to survey the route for the MacRobertson Race, and gathered much useful data during a fifteen-day journey to Darwin. On their return flight they beat all previous records by doing the journey back to Lympne in 8 days 12 hours. Finally, Lord Sempill flew to Australia in his "Puss Moth" ("Gipsy III") to attend the Centenary Celebrations at Melbourne, and his account of the journey is now appearing week by week in *Flight*.

So recent that the principal facts must still be fresh in everyone's memory, another notable flight was that made to the Belgian Congo from Brussels by Mr. Ken Waller and M. Maurice Franchomme. Carrying Christmas mails in the *Reine Astrid* (Mr. Bernard Rubin's re-named D.H. "Comet"), they made the out and home journey of 8,000 miles in less than forty-five hours' flying time.

Atlantic flights were not much in evidence, apart from the air mail services to South America of the *Graf Zeppelin*, Luft Hansa, and Air France. In May, Lt.-Com. G. R. Pond and Lt. E. Sabelli left Floyd Bennett Field, New York, in a Bellanca monoplane with the intention of flying non-stop to Rome. Petrol feed trouble forced them down at Moy, County Clare, after a crossing lasting 32 hours 4 minutes, and they did not reach Rome until a month later.

France also made an attempt at a long-distance Atlantic



flight, likewise in May, but in the reverse direction. The well-known pilots, Paul Codos and Maurice Rossi, left Paris in the famous Blériot-Zappata 110 monoplane (Hispano-Suiza), *Joseph le Brix*, with San Diego, California, as their objective, but they only succeeded in reaching Floyd Bennett Field, N.Y., after a flight of 38½ hours.

The North Atlantic was again crossed in August, when Messrs. J. R. Ayling and L. G. Reid set out from Wasaga Beach, Canada, in a D.H. "Dragon," *Trail of the Caribou* (formerly the Mollisons' *Seafarer*), with the intention of flying non-stop to Baghdad. Throttle trouble, however, forced them to land at Heston, 30 hours 50 minutes after leaving Canada.

A less spectacular crossing was accomplished by Dr. R. U. Light, who started on a leisurely world tour from Labrador in a Bellanca seaplane on August 27, and flying via Iceland and Orkney, eventually reached Loearno in October.

Of flights across the South Atlantic, mention should be made of that from France to South America and back to Africa by Capt. Bonnot in the Latécoère 30.1 flying boat, *Croix de Sud*, early in the year. He flew 2,500 miles non-stop from Marseilles to St. Louis, Senegal, thence 1,970 miles to Port Natal, Brazil. The return flight to St. Louis was made a few weeks later.

What might be classed as partly Atlantic and partly Arctic was the survey flight carried out by Mr. John Grierson, who on July 20 set out from Rochester in a D.H. "Fox Moth" seaplane ("Gipsy Major") to fly to Canada *via* the Arctic Air Route in order to try out the Marconi-Robinson "homing" wireless equipment. A mishap in Iceland delayed him a few weeks, but he eventually reached Ottawa on August 30.

Two expeditions went to the Antarctic, one led by Lincoln Ellsworth and the other by Rear-Admiral Byrd. The former intended to make a flight in a Northrop "Gamma," piloted by Mr. Berndt Balchen, over the South Pole from Deception Island to the Bay of Whales, but at the time of writing it is not known whether this feat has been accomplished. The latter employed an Autogiro, and in November carried out important flights from Little America.

During last year the Pacific was twice conquered—and claimed one victory for itself. Early in January six "Consolidated" flying boats of the U.S. Navy, under the command of Lt.-Com. McGinnis, flew non-stop in formation from San Francisco to Honolulu (2,100 miles) in 24 hours 19 minutes. On October 21 Sir Charles Kingsford-Smith, accompanied by Capt. T. Taylor, left Brisbane in his Lockheed "Altair" (Pratt and Whitney "Wasp") and flew 1,521 miles to Suva, Fiji. After a slight delay

by bad weather he completed another "hop" of 3,197 miles to Honolulu, and a few days later completed the 2,400 miles on to Oakland, California.

Mr. C. T. P. Ulm—one-time partner with Sir Charles—also attempted a Pacific flight—but with tragic result. He, accompanied by Mr. G. M. Littlejohn and Mr. J. L. Skilling, set out, on December 3, from Oakland, California, in an Airspeed "Envoy" (two Armstrong Siddeley "Lynx") with the object of surveying the route from Canada to Australia. The following day they sent out messages saying they were coming down off Honolulu owing to lack of petrol. Since then, in spite of exhaustive searching, no trace of them has been found. Like that of Bert Hinkler, this tragedy was a severe blow to British aviation.

Ulm had previously accomplished other noteworthy flights during 1934—in February he carried the first official mail from New Zealand to Sydney, Australia, in his Avro X, *Faith in Australia*, and again in April he made a similar flight from Sydney to New Zealand and back. Sir Charles Kingsford-Smith also carried out a flight across the Tasman Sea—his third—in the famous Fokker monoplane *Southern Cross*. This flight was accomplished on January 13, with Capt. Taylor and Mr. Stannage. The Tasman Sea was again crossed in November, when Messrs. J. D. Hewett and C. E. Kay—competitors in the England-Australia air race—flew in their D.H. "Dragon" from Sydney to Palmerston, New Zealand.

There were many minor noteworthy flights during 1934, but space will not allow more than the following brief résumé of some of them.

February.—MM. Robert Germain, Descamps, and P. Laveaux made the first flight from Algiers, over mountains and desert, to Lake Chad (West Africa) in a D.H. "Dragon."

March.—Senhor Carlos Bleck, a Portuguese pilot, flew from Lisbon to Pangim (Portuguese India), 6,606 miles, in a D. H. "Moth" ("Gipsy Major") in a flying time of 62½ hours.

M. and Mde. Guy Hansez flew in a D. H. "Fox Moth" ("Gipsy Major") from Antwerp to Leopoldville (Belgian Congo) via Toulouse, Oran, and Douala, in five days.

April.—The Duchess of Bedford, accompanied by her personal pilot, Capt. C. R. Preston, started from Lympne in her D. H. "Puss Moth" on a flight to Senegal and back via the West Coast of Africa.

June.—A Danish Hawker "Dantorp," piloted by Capt. Grandjean and accompanied by Lt. Muenter and G. Rasmussen, flew from Copenhagen to Faroë Is., 1,000 miles, in nine hours.

July.—Flt.-Lt. G. Tyson, on July 25, the anniversary of Blériot's cross-Channel flight of 1909, flew upside down from Dover to Calais in a D. H. "Tiger Moth."

August.—Mr. E. W. Percival flew a Percival "Gull" from Gravesend to Copenhagen, 640 miles, in 4 hours.

September.—Sir Charles Kingsford-Smith and Capt. Taylor flew non-stop in the Lockheed "Altair" from Melbourne to Perth in 10 hours, 22 minutes. A return flight shortly after, to Sydney, was accomplished in 9 hours, 32 minutes.

Capt. Neville Stack flew from London to Copenhagen and back in a "Hawk Major," covering the 1,400 miles in 10 hours, 50 minutes. A few days later he flew from London to Naples, via Marseilles and Rome, in 9 hours, 50 minutes, returning next day in ten hours.

November.—Lt. Humberto da Cruz, a Portuguese pilot, and Sen. Carlos Bleck flew from Lisbon to Timor, Portuguese East Indies, in a D. H. "Leopard Moth," in 13 days. He arrived back in Lisbon after a total absence of 27 days.

M. Christian Moench, President of the French Aero Club de l'Est, accompanied by M. Jean Latinot, completed a flight, in a D.H. "Leopard Moth," from Marseilles to Madagascar in seven days.

WORLD'S RECORDS AND RACES DURING 1934

RECORDS.

GREATEST SPEED (LANDPLANES):

France: 314.3 m.p.h. (*505 84 km/hr*). Raymond Delmotte, on a Caudron monoplane, 370 h.p. Renault 6-cyl. engine, December 25, 1934.

GREATEST SPEED (SEAPLANES):

Italy: 440.677 m.p.h. (*709 202 km/hr*). Francesco Agello, on a Macchi-Castoldi 72 seaplane, 3,000 h.p. Fiat A.S.6 engine, October 23, 1934.

GREATEST ALTITUDES:

Italy: 47.353ft. (*14 433 m*). Renato Donati, on a Caproni 114 biplane, 600 h.p. Bristol "Pegasus," April 11, 1934.

Landplanes.

Speed (100 km).—France: 268.23 m.p.h. (*431 654 km/hr*). Raymond Delmotte, on a Caudron 450 monoplane, 300 h.p. Renault 6-cyl. engine, May 24, 1934.

Speed (1 000 km).—France: 254.26 m.p.h. (*409 184 km/hr*). Hélène Boucher, on a Caudron 450 monoplane, 300 h.p. Renault 6-cyl. engine, August 8, 1934.

Altitude (with *2 000 kg* useful load).—Italy: 27,685ft. (*8 438 m*). N. di Mauro and G. Olivari, on a Savoia-Marchette 72, three 525 h.p. "Pegasus S.2" engines, May 12, 1934.

Altitude (with *5 000 kg* useful load).—France: 10,600ft. (*3 231 m*). Lucien Coupet, on a Farman F.221, four 1,000 h.p. Gnôme-Rhône K.14R.S.D. engines, June 16, 1934.

Light Planes (Land).

Category 1. *Speed (100 km).*—France: 181.4 m.p.h. (*292 018 km/hr*). Raymond Delmotte, on a Caudron C.430 monoplane 120 h.p. Renault-Bengali engine, March 30, 1934.

Speed (1 000 km).—France: 173.38 m.p.h. (*279 018 km/hr*). Capt. Puget and Lt. Moulignat, on a Caudron "Rafali," 140 h.p. Renault engine, August 18, 1934.

Category 2. *Speed (100 km).*—France: 214.66 m.p.h. (*345 622 km/hr*). Raymond Delmotte, on a Caudron C.362, 152 h.p. Renault "Bengali," engine, May 2, 1934.

Category 4. *Speed (100 km).*—U.S.A.: 137.5 m.p.h. (*221 307 km/hr*). S. J. Wittman, on a Wittman-Pobjoy "Special," 75 h.p. Pobjoy engine, February 14, 1934.

Seaplanes.

Distance in Straight Line.—U.S.A.: 2,399 miles (*3 860,823 km*). San Francisco to Hawaii. K. McGinnis, M. A. Mitscher, T. P. Wilkinson, C. S. Bolka and G. C. Eddy, on a 10-P-1, two 650 h.p. Wright "Cyclone" engines, Jan 10–11, 1934.

Distance in Broken Line.—France; 2,357 miles (*3 793 200 km*). Berre to St. Louis, Senegal. Bonnet and Jeanpierre, on a Latécoère 300, four 650 h.p. Hispano Suiza engines, December 31, 1933–Jan. 1, 1934.

Speed (1 000 km).—U.S.A.: 158.12 m.p.h. (*253 601 km/hr*). E. Musick, Boris Sergievsky and Charles Lindbergh, on a Sikorsky S-42, four 670 h.p. Pratt and Whitney "Hornet" engines, August 1, 1934; also seven speed records with loads of *500-700 kg*.

Altitude with *500 kg* load.—France: 31,284ft. (*9 532 m*). M. Bourdin, on Lioré et Olivier seaplane, two 690 h.p. Hispano Suiza engines, January 29, 1934.

Altitude with *1 000 kg* load.—France: 24,630ft. (*7 507 m*). M. Bourdin, on Lioré et Olivier seaplane, two 690 h.p. Hispano Suiza engines, January 3, 1934.

Altitude with *5 000 kg* load.—U.S.A.: 20,407.8ft. (*6 220 m*). Boris Sergievsky and R. B. Quick, on a Sikorsky S-42, four 670 h.p. Pratt and Whitney "Hornet" engines, May 17, 1934.

Gliders.

Distance in Straight Line.—U.S.A.: 158.3 miles (*254 789 km*). Elmira, New York, to Baskin Ridge, New Jersey. R. C. du Pont, on Pont-Bowlus "Albatros II" June 20, 1934.

Women's Records, Landplanes.

Greatest Speed.—France: 276.5 m.p.h. (*445 028 km/hr*). Hélène Boucher, on a Caudron C.450, 315 h.p. Renault-Bengali engine, August 11, 1934.

Speed (100 km).—France: 252.64 m.p.h. (*412 371 km/hr*). Hélène Boucher, on a Caudron C.450, 300 h.p. 6-cyl. Renault engine, August 8, 1934.

Women's Records, Light Aeroplanes.

Category 1. *Speed (1 000 km).*—France: 155.4 m.p.h. (*250 086 km/hr*). Hélène Boucher, on a Caudron "Rafale," 145 h.p. Renault-Bengali, July 8, 1934.

Women's Records, Seaplanes.

Altitude.—Italy: 18,222.6ft. (*5 554 m*). C. Negrone, on Breda 15 seaplane, 80 h.p. Isotta Fraschini Asso engine, May 5, 1934

RACES AND COMPETITIONS.

Coupe Deutsche (France): May 27, won by Maurice Arnoux, on a Caudron C.450 monoplane, 300 h.p. Renault 6-cyl. engine. Speed 241.7 m.p.h. Distance 1,242 miles.

Vincennes Aerobatic Contest (France): June 9–10, won by Gerhard Fieseler, on a Fieseler biplane, Walter "Pollux" engine.

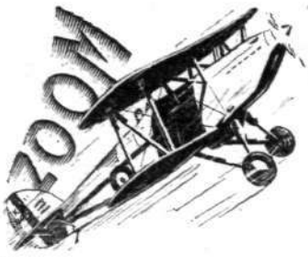
King's Cup.—(England): July 13, won by H. M. Schofield, on a Monospar S.T.10, two Pobjoy "Niagara" engines. Speed 134.16 m.p.h. Distance 798 miles.

Circuit of Europe (organised by Polish Aero Club), September 7.—Won by Bajan, on an R.W.D.9 monoplane, Skoda engine. Distance 5,915 miles.

MacRobertson England to Australia, October 20–23.—Speed race won by C. W. A. Scott and T. Campbell Black, on a D.H. "Comet" monoplane, two "Gipsy Six R" engines. Distance 11,323 miles. Time 70 hours 59 minutes. Handicap race.—Won by K. D. Parmentier and J. J. Moll, on a Douglas D.C.2 biplane, two 715 h.p. Wright "Cyclone" engines.



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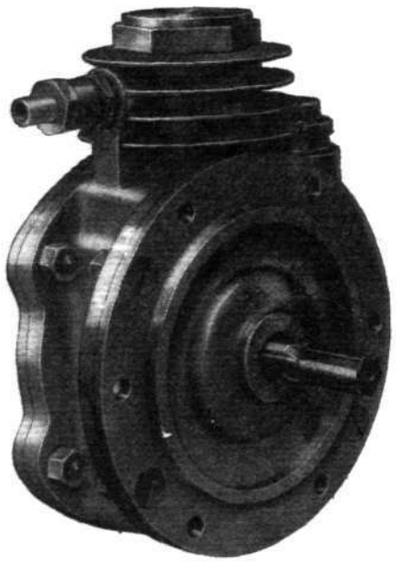
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SCOTT and BLACK in the CITY

A London Luncheon to the Melbourne Race Winners : Interesting Speeches at City Livery Club Gathering

THE Melbourne Race winners, Messrs. C. W. A. Scott and T. Campbell Black, were again entertained last week, this time by the City Livery Club, which body arranged a luncheon in the Grocers' Hall, Princes Street, London, on Friday. The President, Mr. H. Holson Sturges, F.C.A., presided, and among the 385 present were the Lord Mayor of London (Sir Stephen Killik), the Lady Mayoress, and the Sheriffs and Aldermen of the City.

Once again a big audience was regaled with absorbingly interesting talks by Scott and Black on their experiences during the Mildenhall-Melbourne flight. Scott, who was enthusiastically received, opened by saying that the race started long before October 24. Much preparatory work, financial questions and general organisation were crammed into the period which followed the decision to enter the race. He stressed that it was about nine months from the date the regulations were issued to the date of the race, and in that period Britain produced an aeroplane capable of winning, for, as he said, prior to 1934 no British aeroplane existed which stood a chance in the event. The machine was handed over on October 13 and they therefore had but sixteen days in which to test it. They did not even know its petrol consumption, and had no chance to carry out a long-distance flight test. For that reason, in order to save every atom of fuel for the first stage of the flight, they even pushed the machine along the tarmac to the starting point. Nor had they had a chance of a full-load take-off with the machine until the starting flag dropped. This Scott described as the most exciting moment of his life.

By flying at 12,000 feet they were able to cut down their petrol consumption enormously. It averaged, he said, 15.9 gallons an hour. Again, to save petrol and time, they cut off 200 miles by flying 400 miles over the Bay of Bengal. He repeated the story of the uncomfortable thrill they both felt when the second engine cut out over the Timor Sea, 200 miles from Darwin.

Scott emphasised that the aeronautical position of this country was not comparable with that of any other; the distances were not the same, nor were our requirements identical with those of other countries. He urged that demand created the type and that this country was well capable of meeting any demand. He objected to the way in which some reports had tended to decry the British achievement.

Campbell Black described the event as the greatest race of any sort in history, and spoke feelingly of the sporting and friendly attitude of the foreigners with whom they competed. There were no excuses, for they all considered that the "Comet" was the best machine in the race. He went on to say that if only the pilots of other countries would get together as they did in the England-Australia race, there would be little need of huge air forces, for the friendly feeling created would definitely stop war. His sally that they had been told that air mails would be conveyed to Australia in seven days, not as a result of the race, but as a result of prior preparation, was received with much amusement.

Black concluded by saying that if we were to apply ourselves in eight months to speeding up the air mails, our Dominions would be pleased. Australia felt deeply that she was not getting a good enough air mail service, and that was a message he was asked to impress upon everyone concerned—that there should be tremendous speed-up.

EXAMINATIONS FOR CIVIL AIR NAVIGATORS' LICENCES

AIR Ministry Notice to Airmen No. 1 of the year 1935 deals with examinations for Civil Air Navigators' licences. It states that, provided a sufficient number of applications is received, a full examination for First Class Air Navigators' Licences will be held, in London only, on Monday to Friday, March 25-29, 1935, inclusive. Facilities will also be given at centres abroad for candidates to sit, for the written papers only, on Monday to Wednesday, March 25-27, 1935, inclusive, in the case of those candidates who can satisfy the Air Ministry that they can present themselves in London prior to March 1, 1936, for practical tests. The failure of any candidate to present himself in London for the practical tests within the period stated will unconditionally render him liable to sit again for the whole examination.

An examination for Second Class Air Navigators' Licences will also be held on Monday to Thursday, March 25-28, inclusive, at the following centres:—(*a*) London (the offices of H.M. Civil Service Commissioners, 6, Burlington Gardens, W.1); (*b*) Heliopolis (the office of the British Aviation Directorate Representative in Egypt, Heliopolis Aerodrome); (*c*) Baghdad (Hinaidi Aerodrome); (*d*) Singapore (Seletar Aerodrome); (*e*) India (Karachi Aerodrome).

Particulars as to the conditions of examination may be obtained on application in writing to (*a*) the Secretary, Air Ministry (C.A.2), Adastral House, Kingsway, London, W.C.2; (*b*) the British Civil Aviation Directorate Representative in Egypt, Heliopolis Aerodrome, Heliopolis, Egypt; (*c*) the Air Officer Commanding, Iraq Command, Air Headquarters, Hinaidi, Iraq; (*d*) the British Civil Aviation Directorate Representative at Singapore, Royal Air Force Headquarters, Singapore, Straits Settlements; or (*e*) the Director of Civil Aviation in India, Department of Industries and Labour, New Delhi, India.

Formal applications for permission to attend these examinations must be made on form C.A.2.c., and together with the prescribed fees must be received at the appropriate address not later than Monday, February 11, 1935.

Before a licence can be issued, candidates must pass the prescribed medical examination, for which special arrangements will be made where necessary.

Copies of the papers set at previous examinations for Second Class Air Navigators' Licences may be obtained at a small fee from His Majesty's Stationery Office, Adastral House, Kingsway, London, W.C.2, or through any bookseller.

Copies of the papers set at previous examinations for First Class Air Navigators' Licences may be obtained free of charge on application to the Secretary, Air Ministry (C.A.4.), Adastral House, Kingsway, London, W.C.2.

A further examination for Second Class Air Navigators' Licences will be held during October, 1935. An examination for First Class Licences will also be held in March, 1936, if a sufficient number of applications is received.

Developments in Air Survey

WE recently reported an alliance between H. Hemming and Partners and Swedish interests representing the Swedish Prospecting Co. and the Swedish Diamond Drilling Co. whereby an organisation would be set up capable of undertaking surveys combining aerial and geo-physical methods.

The second step has now been taken in the formation of a company, Air and Geo-Physical Surveys, Ltd. Another interesting fact is that Geological Air Surveys, Ltd., a subsidiary company of H. Hemming and Partners, Ltd., has obtained control of the African Air Surveying Co. (P.T.Y.), Ltd. Additional capital, mainly of British origin, has been subscribed for Geological Air Surveys, Ltd., and the African company is at the present completing a survey of the Witwatersrand Reef in Africa.

The linking up of the Swedish interests and the air surveying side will enable work of this nature to be carried out most economically, as an air survey by photographic methods will be made of any selected area, and those that appear to be worth more detailed examination will be dealt with by the Geo-Physical and Diamond Drilling Branch, so that accurate and precise reports of the mineral deposits may be obtained.

Other surveys which have been undertaken in South Africa are one of 25,000 acres of sugar plantation; a survey in Natal for re-organisation of country and main roads, particularly those in hilly districts; a survey for geological purposes in the Lydenburg district; and proposals have been invited for certain geological surveys in association with various Government departments in the Union.

PRIVATE FLYING

Over India by Night

LORD SEMPILL, A.F.C., F.R.Ae.S., CONTINUING THE STORY OF HIS WORLD FLIGHT, DESCRIBES AN AFTER-DARK SEARCH FOR CALCUTTA

HAVING thoroughly enjoyed my short stay at Jodhpur, I left early the next morning with the intention of flying to Calcutta by the nearest route *via* Allahabad. This is the route taken by the K.L.M. and French Air Lines, Imperial Airways machines proceeding, of course, *via* Delhi. One would like to spend a good deal of time in India, and I must certainly include Delhi on the homeward journey. Even if one confines one's itinerary to Northern India there are many interesting and historic places already provided with landing grounds. For example, along the route from Delhi to Calcutta lie Benares, reputed to be the oldest city in India; Allahabad; historic Lucknow and Cawnpore, of mutiny fame; and Agra. One of the most romantic cities of India, Agra is chiefly known as the site of one of the wonders of the world—the Taj Mahal. Of all the cities of the plains of Hindustan, this is probably the most interesting. The Taj itself, built in marble, was erected by the Mogul Emperor, Shah Jahan, as a mausoleum for his wife, Mumtaz Mahal. It is said that it took twenty years to build, and that 20,000 men were engaged on the work.

The Ganges Plain

HOWEVER, much as I should have liked to visit these wonderful centres of interest, they had to be left for another time, and I continued my way to Allahabad, some 600 miles on the direct route from Jodhpur to the old Indian capital, Calcutta. The country between Karachi and Jodhpur, when one passes over the Sind desert, is featureless and uninteresting, but as one approaches Allahabad across the plain of the Ganges the country becomes more cultivated. Between the two centres are two landing grounds, Nasirabad and Jhansi, the latter lying a little to the south of the direct course, but I made Allahabad non-stop in just over six hours.

Having arrived at Allahabad, I refuelled the "Puss Moth" quickly, as I was anxious to push on to Calcutta, which, in any case, I knew I could not reach before dark. Allahabad lies at the junction of the River Ganges and the Jumna, its name meaning "The abode of Allah." Its importance in Hindu history is considerable, as the confluence of these two great rivers, which has a religious significance, has been from the very earliest times a sacred spot. Periodic festivals are held, and are attended by many hundred thousands of pilgrims.

I was glad to reach Allahabad by daylight, as the aerodrome has, as yet, no adequate facilities for night flying. There is, however, a radio service and weather forecasts can be obtained from the meteorological station at Calcutta. Meteorological information for aviation is provided by the Government of India, the service being under the control of the Director-General of Observatories, whose headquarters are at Poona.

The trans-India route is divided into two sections, forecasts and current weather reports being supplied by the meteorologist at Karachi for the section Karachi-Jodhpur-Delhi-Jhansi-Allahabad, and for the section Allahabad-Calcutta-Akyab-Rangoon as far as Victoria Point, by the meteorological office at Calcutta. The weather forecasts are based on charts prepared twice daily at these two stations. The condition of the upper winds is determined at a number of places *en route* by the medium of pilot balloons. The Indian Meteorological Service is doing good work, and it will do much to aid the development of aviation in that country where such facilities are very necessary, particularly during the monsoon seasons.

To continue the journey of 500 miles to Calcutta, the course runs *via* two centres with landing grounds, Gaya and Asansol, but I wanted to reach my objective without a further stop. Although the weather report was not too good, I hoped all would be well, and made good progress over the range of thickly wooded hills between Allahabad and Gaya. After Gaya, the route lies over paddy fields and many rivers. I passed a single conical mountain rising to 4,500ft., and seemed to be well on my course.

Darkness and Cloud

DUSK fell when I was still 120 miles from Calcutta, and I trusted the weather would hold good. When about fifty miles from my destination, however, I came to clouds and went in between two layers. I had seen no beacon and, although I could at first distinguish the lights of several small towns, I could see no sign of the illumination of a large city. I went on as I felt I had set a good course, although I found myself unable to check up my position from the strip maps I carried, which were hardly adequate for navigating by night.

Conditions becoming worse, I began to be somewhat anxious, and thought of trying to land, but wondered whether I should go into a river or the sea. The idea of crocodiles or sharks in such circumstances was not encouraging. One's thoughts in such a case range over all possibilities, and I even considered whether I could find an old dry river bed where I could come down. Feeling certain that I could not be far off Calcutta, I cruised round at various heights for what seemed an interminable time to try and fix my position and find the lights of the city. To add to my discomfort my lamp gave out and I could not read the petrol gauge.

A Cautious Approach

THEN, suddenly, I saw a flash flare in the clouds, and realised with much relief that I was over the beacon. I knew the clouds were very near the ground, however, and as I did not want to risk a crash, I hesitated to come down through them. Putting my engine on and off to warn them I was about, I made off some twenty miles to the north where I had descried a clearing, and having located the beacon, I came through and flew in that direction under the clouds. Soon all was well, and I saw the beacon and made a good landing after having flown about in the dark for nearly three hours.

The Indian official in charge was almost in tears and was nearly as relieved as I was. They had done all they possibly could to help me with the facilities available. They had fired off numerous Very lights, but these were, of course, quite ineffective, and I did not see one. To cope with such an emergency it is very desirable that rockets should be available, and it would be a great help if the beacon could be adjusted to shine vertically through the clouds. It was an experience I should not care to repeat, but it taught me how necessary it is to try and discern all one can at various heights when there is cloud and to stick to it as long as there is any petrol left.

FROM THE CLUBS

Events and Activity at the Clubs and Schools

HAMPSHIRE

Sixty-seven hr. 5 min. were flown during December at Eastleigh by the Hampshire Aeroplane Club. Five machines were in use, and one member, Mr. C. R. Cross, qualified for his "A" licence. Three members, M. M. Shutte, L. T. H. Greig (of Jersey Airways, Ltd.) and F. W. Young, made first solos. One new member joined. There was a record attendance at the Christmas party held in the clubhouse.

BROOKLANDS

A dinner was held in the club on December 23, and the club was then closed down until January 1. Flying hours last week amounted to 15 dual and 25 solo. Maj. Thompson has obtained his "A" licence and Miss Malcolm has completed her tests.

The college reopened on January 2 with eleven new students. Messrs. Thadaney and Dunckley have passed their tests for the "A" and "C" ground engineers' licences.

BRISTOL AND WESSEX

Flying time during December, 1934, at Whitchurch totalled 60 hr. 20 min. Last week Mr. A. C. J. Percy made a first solo.

During 1934 the Bristol and Wessex Aeroplane Club completed 1,704 hours of flying. Eighteen members obtained "A" licences and one member a "B" licence. Two new types of aircraft were purchased, a "Gipsy Major Moth" and a C.30 Autogiro.

The annual Aviation Ball is to be held at the Grand Spa Hotel, Clifton, on Friday, February 15.

READING

The return landing competition between Reading and the Brooklands Aero Club has been fixed for Sunday, January 20, when the latter club intend to wrest back the laurels taken from them in November. This will take place from about 11 a.m. onward, and Brooklands seem very determined to do or die in the matter. In fact, members of their team have already begun practising on the *Reading* Circle!

The club is very pleased to welcome Ft. Lt. "Tommy" Rose, who has now taken up his position as sales manager to Messrs. Phillips and Powis, Ltd.

NORFOLK AND NORWICH

Last year the total flying hours was a record for the club, and the number of pilots trained showed a good increase.

The social side had a good send-off when on the last night of the Old Year well over a hundred members gathered in the clubhouse to welcome the New Year. Dancing commenced at 8.30, and after midnight a giant cracker was exploded by the ladies, and dancing continued until nearly 2 a.m. In March the annual dinner will take place at the club, but it is probable that another supper dance will be held before then.

The weather improved considerably during the week-end and on Friday all machines were in the air.

MIDLAND

During December the Midland Aero Club flew twenty hours—a low total, as a result of the unusually bad weather. However, the clubhouse has been patronised all the more and a jolly dance was held therein on the Saturday before Christmas.

HERTS AND ESSEX

Flying times at Broxbourne for the week ended January 5 were: Dual, 15 hr., and solo, 7 hr. Three new members, Messrs. L. H. Barker, J. Harrington and E. T. Sellick, have joined. There are now seven members studying for their "B" licences.

A "pilots only" dinner will take place on January 24 at the King's Oak, Highbeach.

CINQUE PORTS

Things were again on the quiet side at Lympne as the club was closed for the best part of a week. Flying times totalled 7 hr.

Ken Waller is now back and carrying on with instruction, but he intends to go over to Brussels shortly as he has been asked to attend several functions. Mr. Bernard Rubin's "Comet" is now open for charter work.

CAMBRIDGE

Flying times at Marshall's School and the Cambridge Aero Club for the week ended January 4 were: dual, 25 hr. 30 min., and solo, 10 hr. Two new members joined the school during the week. Thick fog on two days prevented flying, but Friday's sunshine brought members flocking out.

Only two members of the Civil Aviation Service Corps turned up on Sunday, so these were able to put in quite a lot of dual.

HATFIELD

Despite the continuance of the bad weather, 13 hr. 35 min. flying time was put in at the London Aeroplane Club during last week. Members are just returning from their holidays and, provided the weather improves, the club should soon be going very hard again. Two new members, Messrs. R. G. M. Paul and R. L. Miall, have joined.

The flying time at the Royal Air Force Flying Club for the past week was 5 hr. 10 min.

IRISH AERO

Considerable progress was made by the Irish Aero Club during 1934 and a total of over 600 hours were flown. Nearly a dozen new licences, including one to a lady member—Miss Dillon—were issued, and a number of important charter flights, including one to Wick, Scotland, with the Canadian Government Trade Commissioner in Dublin, and two to Fermoy, County Cork, were carried out. According to the chief instructor, Mr. C. F. French, prospects for further progress at the present time are far better than they were at the beginning of 1934.



WITH SINGLE-SPAR WING. The Italian Bergamaschi P.S.1. monoplane is a four-seater with a Fiat A.70 200 h.p. radial. A single spar, manufactured from steel tubes, is used for the wing. A top speed of 161 m.p.h. is claimed and the stalling speed is given as 37 m.p.h. The undercarriage is retractile.

From the Clubs (cont.)

LIVERPOOL

The year's total of flying by the Liverpool and District Aero Club has been usefully high—2,553 hours. During December the figure was 152 hr. 35 min., and during the week ended January 4, 22 hr. 20 min. Nevertheless, bad weather held up operations a good deal during the last month of the year and the figure which, in any case, shows an increase of 83 hours on the corresponding month of 1933, might have been improved.

HANWORTH

Flying hours for the week at the Hanworth Club were 24 hr. 30 min. Numerous demonstrations of the Monospar S.T.10 have been given, and Mr. A. L. T. Naish flew to Guernsey last Friday to give another demonstration to the inhabitants.

A demonstration of illuminated night banner flying was given on Saturday night last, and the letters on the banner can be seen from quite a distance.

Private Flying

Mr. J. C. Gibb successfully passed his instructor's test at Hatfield. He has been coached by Mr. D. W. Llewellyn, the second instructor at Hanworth, and will act as co-honorary instructor to the Insurance Flying Club with Mr. Clair.

NORTHAMPTONSHIRE

The Christmas activities at Sywell were a great success, especially the children's tea party, for which Midland Airways were chartered by Santa Claus to bring him to the aerodrome. He landed well after dark with the aid of the Club flood lighting.

A series of lectures have been organised by Mr. E. Goldsmith, the chief instructor, and the first took place last Thursday. Mr. Geoffrey Linnell, also, was host at a very successful dinner, at which he entertained a number of members of the Club.

The plans for the bathing pool, which is being laid down, have now been completed and work should start in the very near future.

THE YEAR AT HAMBLE

Twelve Months of Flying and Ground Instruction at A.S.T.

LAST year proved a successful one for the School of Air Service Training at Hamble. A total of 8,240 hours was flown, compared with 6,425 hours in 1933, and 4,300 hours in 1932. July's total of 1,276 hours set up a new school record; as much as 71 hours 25 minutes was flown in one day during this month.

This notable increase was made possible by the comprehensive fleet, which at present consists of two Avro "Avians," twelve "Cadets," two "Tutors," one 626, four A.W. "Atlas," one "Siskin," one C.30 Autogiro, one Avro V (three engines), one "Avian" seaplane, two "Cutty Sark" amphibians, and one Avro 504 seaplane.

The following Air Ministry licences were obtained by A.S.T. students during 1934: Thirty-six "A," five "B," one 1st Class Navigators', five 2nd Class Navigators', nine Ground Engineers' "A" and "C," six Ground Engineers' "X," four W/T. Operators', and three R/T. Operators'. The certificates of proficiency issued for other courses included twenty-four for blind flying and six for flying instructors' courses. A.S.T. is also under contract to the British Air Ministry to carry out the annual training of R.A.F. Reserve pilots on both landplanes and flying boats.

The school staff with Group Capt. R. J. F. Barton, O.B.E., as Commandant and Fl. Lt. H. F. Jenkins as Chief Instructor, consists of seven flying instructors, a chief ground instructor, and twelve resident technical and assistant ground instructors.

The long commercial course, which is of three years' duration, is proving remarkably successful. It is specially designed for the *ab initio* pupil who is taking up aviation as a career, and is intended to train him for administrative as well as for flying employment. That it fulfils its purpose is shown by the fact that the first two students to complete it have received appointments as First Officers with Imperial Airways. At the conclusion of his course a student is in possession of the Pilot's "A" and "B" licences, 2nd Class Navigator's licence, Ground Engineer's "A," "C," and "X" licences, and a W/T Air Operator's licence, with the added knowledge that he has received the most complete training. Thirty-three pupils are taking this course at present. The course is run in terms; those in 1935 will commence on January 15, May 7, and September 2.

At A.S.T. special consideration is given to training in the art of blind flying. There are eight aircraft of three different types fitted out for dual instruction in this subject. Instead of using only Reid and Sigrist type of indicators throughout, the pupil is able to gain further experience in aircraft fitted with a Sperry Artificial Horizon and a Directional Gyro.

In addition to the theoretical training in air navigation, an Avro V has been fitted with the necessary wireless and navigation apparatus and the spacious cabin transformed into what is virtually a flying classroom.

The rapid expansion of the school led to a shortage of sleeping quarters, so that the accommodation had to be increased. A block containing fifteen rooms was added, and this is shortly to be increased still further. The A.S.T. club was also enlarged. From the first, consideration has been given to providing congenial means by which pupils may keep themselves fit. To this end organised games have been arranged, and a fully equipped gymnasium is also available. The Hamble river provides an ideal yachting centre and the A.S.T. Yacht Club possesses five "Star" Class dinghies.

The Edinburgh Club

Three months ago the Edinburgh Flying Club was formed, and has already received promise of support from 200 people. Flying is likely to be started quite soon with a D.H. "Major Moth" at Macmerry aerodrome, East Lothian.

Memorial

Some little time before Gerald Royle's tragic death in an accident at Scarborough last summer he had expressed a wish to give a donation to the Reading Aero Club's Flying Scholarship Fund. He often visited Woodley, and Mr. and Mrs. Royle later carried out his wish, presenting a sum which, with additions, has been spent in equipping a Navigation Room with maps and other aids. It is to be called the Gerald Royle Memorial Room, and it is hoped that the Royles will open it early in the year.

The Royles have now presented the club with a sum of £200 "to assist the private members to purchase their own machine." A scheme has been evolved whereby regular flying members are asked to subscribe £5 each towards the balance necessary to purchase a Cirrus III "Hawk," in return for which they will be able to fly the machine at 30s. an hour. Mr Powis has promised to sell a machine to the club at a considerably reduced price.

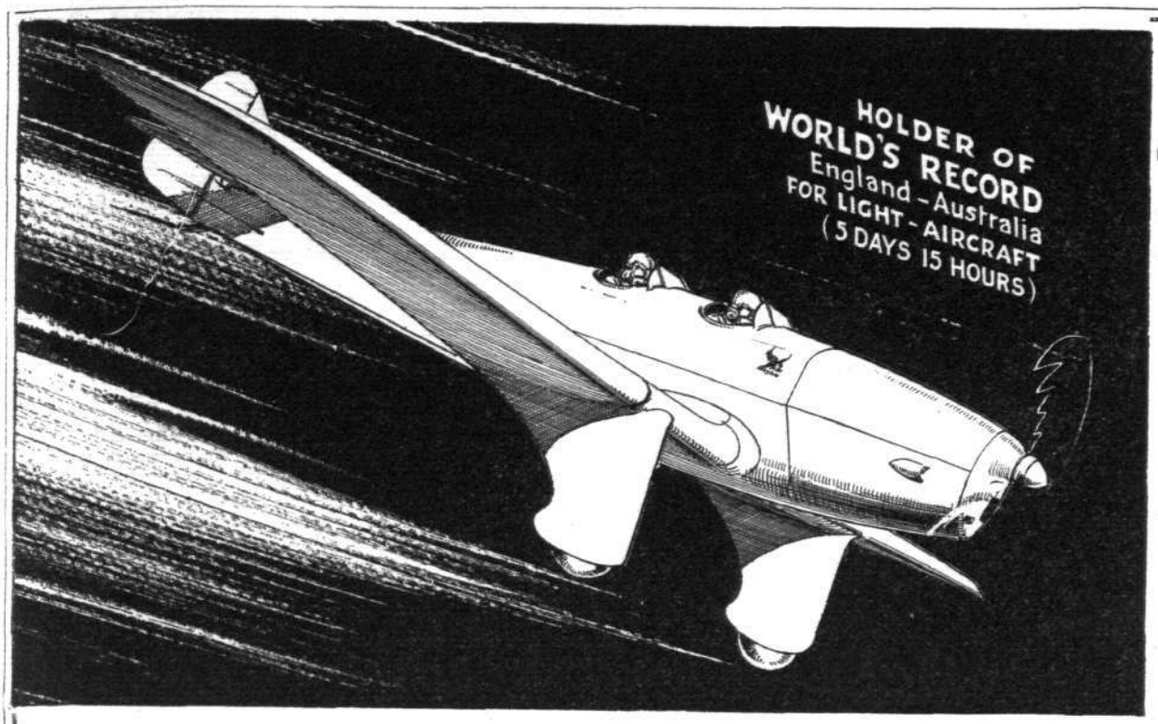
A Northamptonshire Reunion

The Northamptonshire Aero Club propose to entertain all the war-time pilots living in and around Northampton, Kettering, Wellingborough, and Bedford, and would be glad to learn the addresses of, or to hear from, any pilots who would care to be their guests for an evening. The address of the Northamptonshire Aero Club is Sywell Aerodrome, near Northampton

Not So Contradictory

In reviewing their year's operations at Heston (see p. 56) Airwork, Ltd., disclose that although the number of hours flown by the School machines during 1934 was 28 per cent. better than the previous year's total, weather conditions actually caused a drop of 12 per cent. in flying days, only 239 out of the 365 being flown, as compared with 281 in the previous year.

When the drought is remembered this seems surprising, but the School puts it down mainly to the surface wind, caused by the heating of the ground which is characteristic of many of the hottest days. This wind reaches its maximum at about 2 p.m. and dies down towards evening. It gives rise to violent bumps at a low altitude which hinder school flying, while they do not greatly inconvenience experienced pilots who are not, in any case, normally making low circuits.



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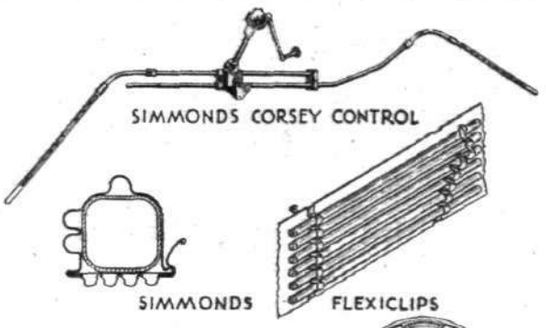
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COMMERCIAL AVIATION

AIRLINES — AIRPORTS



FOR A.B. AERO-TRANSPORT: The first of the new Fokker F22s (four P. and W. 525 h.p. "Wasps,") which, as stated in *Flight* last week, has successfully passed its tests. Three of these 23-passenger machines will also be supplied to K.L.M.

CROYDON

Two Very Distinguished Passengers : The Douglas Mystery Story : Another D.H. "Express" for Qantas : Catering for the Wilderness : Heavy Freight

CONSIDERABLE interest was displayed in the journey to Paris, by Imperial Airways, Ltd., of the Duke and Duchess of Kent last Saturday. The flight was unofficial and the Royal couple were described by an Imperial Airways official as "ordinary distinguished travellers." Can people be both ordinary and distinguished? Perhaps so, for the Duke and Duchess naturally looked distinguished, but at the same time gave everyone the impression of being an ordinary jolly and happy young couple. The Duchess might have been departing by air for the twentieth time, instead of for her first flight. Four seats were reserved in the machine, and this virtually gives a small private compartment in machines of the *Heracles* class. There appears to have been some confusion about the Press arrangements. First of all some dissatisfaction was caused because all reporters and cameramen were barred, and further annoyance was caused by the fact that quite a number of Press cameras were clicking merrily away on the tarmac. Anyway, it seems hard lines to debar our Press at Croydon and allow the French pressmen full scope at Le Bourget.

My little story last week, of the two mysterious Dutchmen who enquired of the traffic porters at Croydon whether the "Flying Dutchman" had yet crashed, appears to have been something of a "scoop." After reading *Flight*, half the newspapers in London were telephoning for further details and sending representatives to the airport to interview the traffic porters.

During last week Capt. "Jimmy" Youell was seen flying the new D.H. 86 for Qantas. He left Croydon last Monday to deliver this aeroplane to the Australian firm.

The Imperial Airways liner *Syrinx*, with Capt. Armstrong in command, left here on Saturday morning last on an interesting special charter flight (reported in *Flight* last week) with officials of the Iraq Petroleum Company. Special catering arrangements were made in advance on this trip, so that a West End standard of meal should be maintained throughout the cruise, and supplies were sent in advance to various depôts along the route. The days when journeys were made through the wilderness on pemmican and water, or, failing these, locusts and wild honey, are over, and the lonely cache of to-day contains caviare and Veuve Clicquot.

One does not hear much of the stout work being done along the pipe-line by the Imperial Airways pilots, Capt. Wheeler and Acting Capt. Messenger who, with an Avro Ten and a Westland "Wessex," are ceaselessly engaged on patrol work and the conveyance of officials from point to point.

Last Friday Mrs. Keith Miller left for Cape Town in a "Redwing," on which the names of various proprietary articles were blazoned forth. It seems she is acting as a sort of commercial traveller, and the "Redwing" has been selected for its slow landing speed and capacity to sit down safely in confined spaces.

People who think air freight is mostly perishable or fragile may be interested to hear of a single parcel recently carried to Paris by Imperial Airways It was, I believe, a gear wheel, weighing 16½ cwt.! Lots of heavy machine parts and spares for motor cars which are urgently needed are sent by air, and motor cycles frequently form part of the air freight. The heaviest cargo carried is, of course, bullion, packed in boxes carefully made up to weigh as much as a strong man can possibly lift with an effort, but too heavy for him to move fast or far.

Last Monday was a day of curious flying weather. A K.L.M. pilot flying inwards to Croydon in the morning told me that he had encountered rain, snow, and some fog on the journey.

It is gratifying to hear that the duplicated Empire services of Imperial Airways, Ltd., are already fully booked up for every journey.

A. VIATOR.

Another Aerodrome

Maidstone Town Council is to proceed with a scheme for the establishment of a municipal aerodrome on a site in Langley Road, about 2¼ miles from the town.

Deruluft's Record

Since the German-Russian air transport company, Deruluft, was formed in 1922 there has been no serious accident—a record which would take a lot to beat. Rohrbach "Roland III," Junkers Ju52 and A.N.T.9 machines have been used, and the yearly passenger figures have increased from 570 in 1922 to 28,000 in 1934 on the Berlin-Moscow route. Starting as a bi-weekly service from Königsberg to Moscow *via* Kaunas and Smolensk, with Fokker machines, the company now runs daily services between Berlin and Moscow and between Berlin and Leningrad.

Commercial Aviation

HESTON

The Year's Work : Big Increases in Traffic Handled : Some Surprising Facts about the Weather : The Promise of 1935

AT this stage it is fitting that the year's work at Heston should be reviewed, and it is undesirable that some very interesting facts come to light. A register of traffic during the "controlled" period from 10 a.m. till sunset has only been kept since last May. Therefore the figures for the last six months are best quoted, since they need only be doubled to obtain an approximate figure for the whole year. From July to December inclusive, 15,245 take-offs or landings, apart from school aircraft, were recorded during the controlled period. This works out at an average of 84 per day. July was the busiest month, with 4,268 aircraft movements. Estimating the whole year's external traffic on the basis of the statistics given, 30,000 aircraft movements is a reasonable figure, particularly as the weather is shown by the school records to have been decidedly better in the first half of the year.

A total of 3,700 aircraft and 12,037 persons cleared customs. This is an increase of 182 per cent. on last year's figures, largely due to the starting of regular summer and winter airline operation from Heston by Jersey Airways, Limited, in January, 1934. No fewer than 187,755 gallons of petrol were sold in 1934—rather more than twice the number sold in the previous year—while seventy-five aircraft were overhauled for certificates of airworthiness.

Weather has such an important effect on flying activities that it should find a place in this brief review. Hestonites froze in January, drowned in February, revived hope in March, lost it again in April, settled down to a waterless summer which surprisingly failed to produce as many flying days as the previous one, and abandoned themselves in October, November and December to unrelieved gloom. In 1933, the Airwork School had flown 281 days out of the 365—77 per cent. flying weather. In 1934, only 239 days were flown—a drop of 12 per cent. Nevertheless the school put in 28 per cent. more flying hours than in the previous year, the new total being 3,314 hours.

As regards companies operating from Heston, Jersey Airways, Ltd., head the list with exactly 7,000 passengers carried between the Airport and St. Helier. 1,765 aircraft journeys are recorded. This works out at an average of four passengers per "Dragon," which, as six passengers with baggage is the maximum number allowed per machine, seems an excellent record for an airline in its first year of operation. Jersey Airways hope to get their four-engined D.H.86s into service early in February.

B.A.N. Co. carried over 3,200 passengers and flew 189,252 miles in the course of their usual private charter work and seasonal airline operation. On the regular services to French coastal resorts, over 1,900 passengers were carried between March 1st and September 30th. Next summer will, of course, see the transfer of B.A.N. Co.'s headquarters from Heston to Shoreham, where they are to operate the new Brighton, Hove and Worthing airport.

Birkett Air Service, Ltd., have had a successful year, showing a 30 per cent. increase in turnover. In the course of 1935 they hope to put into service one or more 4-seater aircraft of a type not yet decided upon. They are shortly taking delivery of a new "Leopard Moth."

P.S. and I.O.W. machines carried 2,875 passengers on their Heston-Ryde route.

It remains to be added that another well-known Heston concern, Brian Lewis and Co., Ltd., disposed of over forty "Leopard Moths" and twenty "Moth Majors" and a number of "Dragons," while Henly's Aviation Department has had a successful year, during which twenty new and thirty-four second-hand aircraft have been sold.

And now Heston is looking forward to a prosperous 1935. A building and development programme only awaits final signatures on the contracts. Already a new hangar has arisen to the North-West, and mysterious drawings of architectural significance are passing backwards and forwards from one department to another.

HERE AND THERE

A Non-stop Mail Flight to South America

Later this month, if the weather is suitable, Codos and Rossi will fly non-stop to South America carrying a special mail. A special cancellation will be used if, by any chance, the long-distance record is broken.

Fire Fighting

Shadrach, Mesach and Abednego will soon be outrivalled by the Heston traffic staff, who are going very thoroughly into the question of specialised fire-fighting equipment for aerodromes. In a recent demonstration the Airport Superintendent submitted to a fiery trial of 1,400 deg. and emerged scatheless, wearing asbestos clothing.

An "Electra" for Alaska

Pacific Alaskan Airways has, as forecast in *Flight* of December 27, taken delivery of a Lockheed "Electra" which will be flown on the services from Fairbanks to Nome and to Bethel. The "Electra" has been specially equipped for flying in Alaskan conditions.

In the spring a new service may be run to Whitehorse and Juneau to make connection with the Alaska Steamship Company and the United States. Six radio stations are also planned.

South African Airways Developments

During the spring or early summer it is probable that the South African Airways' headquarters will be moved from Durban to Johannesburg and Mr. J. A. Lindberg, the new superintendent, is busily planning new lines.

Services to Delagoa Bay and to Walvis Bay are probabilities —the latter area is held as a monopoly by South-West African Airways—and the new six-seater Junkers Ju.160, a fast single-engined machine, illustrated in *Flight* of November 8, 1934, may be put on a once-weekly service from Cape Town to Windhoek. The Ju.160 cruises at more than 180 m.p.h.

New Zeppelin Company

A new company is to be formed to organise international and internal services from the base at Frankfurt, and the promoters are to be the Government, the Deutsche Luft Hansa, and the Zeppelin Company at Friedrichshafen.

Black Magic

Some confirmation of a statement made in *Flight* as long ago as December 6—to the effect that the Mollisons' "Comet" was to be sold for a Portuguese Atlantic attempt—has now appeared.

Italy's Aviation City

On April 21 Signor Mussolini will formally open the new city, Guidoni, which has been built solely as an aviation centre. The city is named after General Guidoni, who was, a few years ago, the Italian Air Attaché in London and who was killed in a parachute accident.

Air Transport in Conference

To-day, and on Friday and Saturday, the Air Transport section of the S.B.A.C. will hold its first conference since the section was re-formed in March last year. Some 250 representatives of operating firms and municipalities—thirty-eight of the latter have promised support—are expected to attend, and the conference should be of considerable value after such a progressive year.

Grosvenor House is the scene, and the first act opens at 11 a.m. A paper on the organisation of air transport will be read by Maj. R. H. Thornton at 4 p.m., and in the evening there will be an official dinner. On Friday papers will be read by Mr C. V. Allen (at 10.30 a.m.), by Mr. H. R. Gillman, A.F.R.Ae.S. (at 2 p.m.). and by Mr. H. N. St. V. Norman (at 4 p.m.). Saturday will be occupied by visits to Croydon and Heston.

Newspapers to the Saar

Since B.A.N.Co. opened their daily service to the Saar, Messageries Hachette have arranged for the conveyance thereby of all the London dailies, which are received at midday.

D/F Equipment for Egyptian Aerodrome

The Egyptian Ministry of Communications has ordered Marconi-Adcock direction-finding equipment for installation at Mersa Matruh aerodrome near Alexandria. The new equipment will provide additional guidance for Imperial Airways and others over the Mediterranean and Northern Africa. It is claimed that the Marconi-Adcock is not materially subject to the "night effect," so that a twenty-four-hour service will be possible.

From Prague to Moscow

The possibility of an air service linking Prague and Moscow is under consideration for this year. There are two alternative routes: One is a continuation of the existing service between Prague and Warsaw, and the other a prolongation of the Prague to Uzhorod service. The latter, though longer, necessitates little flying over territory other than that of Czechoslovakia or Russia.

The service between Prague and Uzhorod is conducted by the Czechoslovak State Air Lines, and the suggestion is to continue to Kieff and Moscow *via* Cernauti in Rumania. The flight between Prague and Moscow would be made in a day.

To Meet Canadian Requirements

What is claimed to be the first aeroplane designed and constructed entirely in Canada and expressly to meet Canadian conditions has been produced by Fairchild Aircraft, Ltd., of Longueuil, Quebec. The machine, which may be operated as a landplane, seaplane, or on skis, is a strut-braced high-wing monoplane with a Pratt and Whitney "Wasp" T1D1 engine of 520 h.p. enclosed in an N.A.C.A. cowling and driving a Hamilton Standard controllable pitch airscrew.

The pilot sits well behind the wing in a cockpit with a sliding roof, and nine passengers, or the equivalent amount of freight, are carried in a cabin forward of this cockpit, and this is fitted with a wide door to facilitate the loading of bulky articles. At present the machine uses a wing of similar section to that employed on the old Fairchild 71, which has given such excellent service in Canada. The fuselage is an advanced type of metal monocoque structure.

Tests have not yet been completed but, at an all-up weight of 7,000 lb., the maximum speed is about 140 m.p.h. and the landing speed in the neighbourhood of 60 m.p.h.

A Central Airport for Assam

Preparations are being made to build, at Soneivill, a central station for the air mail service for the whole of Assam. The site is nine miles from Tejpu and borders on the Chardnar, at the foot of the Bhutan Hills. A vast area of land has been apportioned out of the Government's reserve land for the purpose. The site has been surveyed by certain officials of Indian National Airways.

The Channel Accident

The Air Ministry has now published a report on the accident to the Hillman "Dragon Six," which occurred on October 2, 1934, and from which there were no survivors.

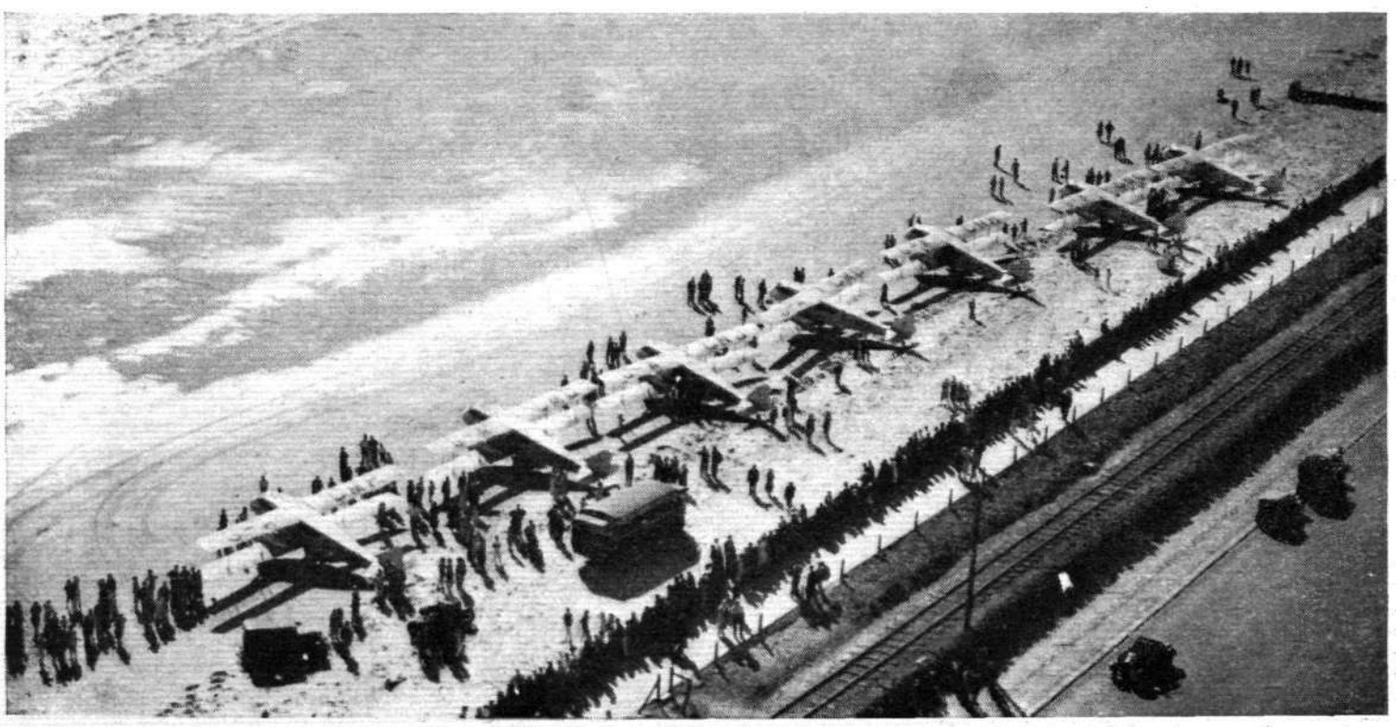
There appears to be little doubt that, in spite of his general experience, the accident was due to the pilot's lack of skill in matters of navigation and blind flying. The visibility near the ground was extremely poor, though there was little cloud between 3,000 and 8,000 feet, and the pilot had chosen to follow a coastal route rather than to proceed on a direct compass course in or above the clouds. The machine flew into the sea while making a gradual descent, the pilot having failed to distinguish the glassy surface of the water in time to avert the disaster. He had been given a bearing by Croydon on request, but there was no response when Croydon attempted to give his full position. There was no question of the airworthiness of the machine.

The Dewoitine 620

In last week's issue of *Flight* it was suggested that the Dewoitine Co. were building a series of new thirty-passenger transport monoplanes for use on the 1935 Air France Paris-London service.

These new Dewoitine 620s will have retractile undercarriages, and will be equipped with three geared Gnome and Rhone 800 h.p. double-row, air-cooled radial engines, type 14 Krsd, slightly supercharged, and will have an estimated speed of 194 m.p.h. (310 km/l) at ground level and 217 m.p.h. (350 km/l) at an altitude of 6,560ft. (2,000 m.). The machines will be constructed of duralumin throughout. The wings will be fitted with split trailing edge flaps, and, together with the fuselage, will be covered with smooth vedal sheet, similar to the construction employed in the "Antares" type.

The fuselage, again, is of monocoque construction, and is divided into two sections. The first comprises a baggage hold, pilots' cabin, radio compartment, and a cabin with accommodation for nine passengers. The rear part contains another and larger cabin to accommodate twenty-one passengers. A bar, a lavatory, and a second hold for baggage are located in the after portion.

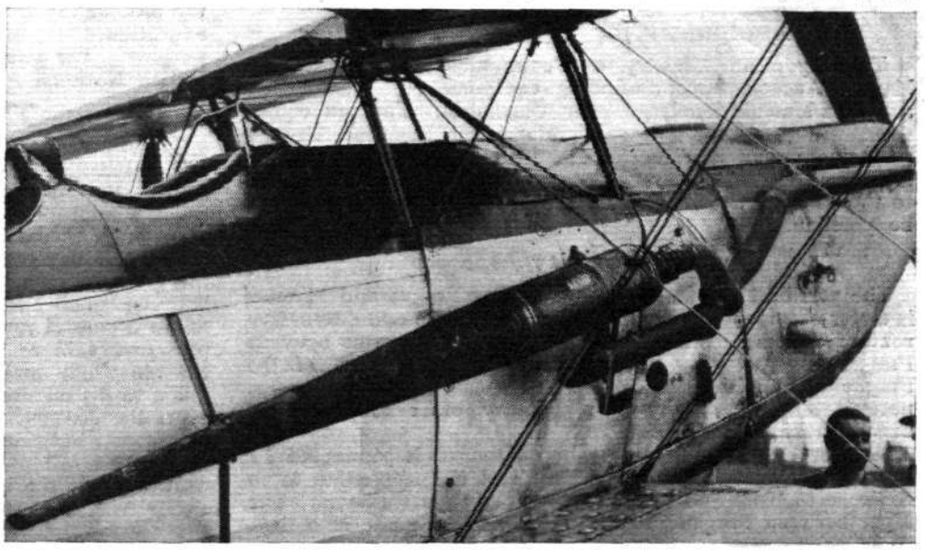


WHAT OF 1935? Last year Jersey Airways carried more than 20,000 passengers, using, as mentioned in the review on page 34, eight "Dragons." Here are seven on the beach at St. Helier; the charabanc "waiting room" in the middle foreground was lost at sea soon after this picture was taken! The cause was a high tide.

THE INDUSTRY

SLOTS FOR NEW ZEALAND

HANDLEY PAGE, Ltd., announce that an agreement has been concluded whereby the New Zealand Government, in consideration of a lump sum payment, may fit Handley Page slotted wings to aircraft ordered by them. This is another important step towards world-wide adoption of wing slots. Already all the leading Powers are standardising use of the slot device on military and civil aircraft, or are engaged in negotiations with that end in view. Including the New Zealand Government, seven Governments have now effected agreements with the Handley Page company, either in the form of a lump sum payment or by a combination of lump sum payments and royalties; the others are Great Britain, France, India, the United States, Sweden and Finland. In Canada and Italy the rights are owned by companies formed specially to handle the invention, and in Japan a private company has acquired the naval rights. In no fewer than thirty-four other countries the slot is used extensively on military and civil aircraft.



SILENCING of aero engines is receiving a great deal of attention at the present time. In *Flight* for September 27, 1934, tests with the Vokes silencer were described. Here is a photograph of one of the same make fitted to a "Fairey 111.F."
(*Flight* Photograph.)

DELMOTTE'S SPEED RECORD

It may be of interest to note that in establishing the world's speed record for land planes of 314.3 m.p.h. M. Raymond Delmotte's Renault engine in the Caudron monoplane was fitted with K.L.G. plugs, and that the lubricant used was Wakefield's Castrol oil.

IMPORTANT WOLSELEY CHANGE

An important announcement regarding Wolseley Motors has been made by Mr. W. Cannell, joint managing director; in future the aviation and automobile sides of the company will be segregated under separate control, Mr. Cannell devoting his entire attention to the former. It is Lord Nuffield's intention to emphasise this aspect of the business.

A NEW YEAR'S MOVE

In the near future the General Aircraft factory, which is now at Croydon, will be transferred to larger works at Hanworth for the increased production of a wider range of Monospar aircraft and the new four-cylinder inverted Vee engine.

A NATIONAL BENZOLE APPOINTMENT

Mr. Albert Hittinger, general manager of the National Benzole Co., Ltd., has been appointed a director of the company. Mr. Hittinger has been associated with that company since its inception in 1919, and became general manager in 1925.

THE PERCIVAL "GULL" IN AUSTRALIA

According to a letter received by the Percival Aircraft Co. from James Patrick and Co., of Sydney, Australia, regarding the performance of one of the "Gulls" which they have in service, this type of machine is giving entire satisfaction. The "Gull" in question has been engaged on general taxi work, where speed is essential and special survey duties, continuously for nearly two years. It has undertaken many journeys of 5,000 miles on special charter work, and during the whole of the time that it has been in operation the company have had no reason to apply for any replacements.

MR. LOADER'S NEW POST

Mr. R. A. Loader relinquished his post with the de Havilland Aircraft Co. Ltd., last Saturday in order to join the board of directors of the old-established firm of advertising consultants, Samson Clark and Co., Ltd. Mr. Loader was assistant business manager at Stag Lane for four years, and his work in connection with the early days of the "Moth" was extremely valuable to the firm. He was then transferred to Canada as vice-president and managing director of the Canadian company, a post which he held for six years, returning to the parent company a year ago. His innumerable friends in the aviation world will be glad to know that Mr. Loader proposes to keep in close touch with flying matters, and they will wish him every success in his new sphere of activity.

NEW COMPANIES

WEST AFRICAN AIRWAYS LIMITED. (Fenton House, 112/114, Fenchurch St., E.C.3.) Nominal capital of £5,000 in 10/- shares. Objects: To establish, run, work and/or manage an aeroplane service, and for this purpose to own, hire or build aeroplanes, seaplanes or other mechanical or automatic kind of aircraft for the purpose of transport of passengers, goods, mails, etc., to and from the West Coast of Africa or any other part of the world. The first directors are:—Wm. T. Duffey, 37, Talgarth Road, West Kensington, W.14, merchant. Douglas G. Carr, 33, Dollis Park, Finchley, N.3, merchant shipper. Solicitors: F. J. Rutledge, 16/17, Devonshire Square, E.C.

COMPOSITE CONSTRUCTIONAL MODELS, LTD. (145, Croydon Road, Caterham, Surrey.) Capital £500 in £1 shares. Objects: To carry on and turn to account the manufacture and sale of wood*meal* cement known as "Pastic," and to manufacture and sell any articles, including constructional models, aeroplanes, etc., which can be made with "Pastic." The first directors are:—Harry C. Gordon, 300, Coombe Lane, Cottenham Park, S.W.20. Albert S. Palmar, 70, Tadworth Road, N.W.2. Secretary: A. S. Palmar.

CHANGE OF NAME

WRIGHTSON AIR HIRE LTD. (Heston Airport, Heston, Mddx.) Name changed to Air Hire Ltd. on December 14, 1934.

INCREASES OF CAPITAL

TECHNICAL LIGHTS & EQUIPMENT COMPANY, LTD. (Manufacturers of marine, aviation and other technical lighting equipment, etc. 9-10, Bentinck Mews, Marylebone Lane, W.1.) The nominal capital has been increased by the addition of £2,400 beyond the registered capital of £100. The additional capital is divided into 1,210 "A" and 1,190 "B" shares of £1 each.

PUBLICATIONS RECEIVED

The Romance of Exploitation and Emergency First-Aid from Stanley to Byrd. London: Burroughs Wellcome and Co.

Brasses. Booklet. No. 1. London: Copper Development Association, Thames House, S.W.1.

Making it Happen. The Rise of Sir Macpherson Robertson. By George Taylor. Price 5/- net. London: Robertson & Mullens, Ltd., 231, Strand, W.C.2.

Luftfahrt. Eine Einführung in das Gefamtgebiet. Berlin: Datsch-Lehrmitteldienst G.m.b.H., Potsdamer Strasse 119b.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m = motors. (The numbers in parentheses are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1933

Published on January 10th, 1935.

14248. OCKENDEN, A. G., NEIL, J. R., and OCKENDEN, M. Aircraft. (421,178).
23134. BLACKBURN AEROPLANE & MOTOR CO., LTD., BUMPUS, F. A., and BOLTON, F. Aileron gear for aircraft. (420,928).
23371. AIR LOG CO., LTD. and MAYERS, H. C. Flying-time and like indicators. (421,207).
29303. SPERRY GYROSCOPE CO., INC. Gyroscopic apparatus particularly for use on aircraft. (421,079).

APPLIED FOR IN 1934.

6993. DEEG, P. Bomb-dropping devices in toy aeroplanes. (421,235).

FLIGHT

Prepaid Advertisement Rates: 2d. per word, minimum 3/6. Series Discounts are allowed to trade advertisers as follows on order for consecutive insertions, provided a contract is placed in advance. 13 consecutive insertions, 5%; 26 consecutive, 10%; 52 consecutive, 15%. Situations Wanted ONLY, 18 words, 1/6, 1½d. per word after. Box No., 6d. per insertion extra. Latest time of arrival of advertisements for these columns, **FIRST POST TUESDAY** of each week at: Dorset House, Stamford Street, London, S.E.1, or one day earlier at branch offices (addresses, see first Editorial page).

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Agents for BRITISH KLEMM AEROPLANES

£565 **PUSS MOTH.** C. of A. to September. Engine just top overhauled, air frame repainted and entirely reconditioned. Fitted bronze heads. Turn and bank indicator, navigation lights.

£450 **GIPSY II MOTH.** 12 months' C. of A. 20 hours since complete overhaul. Air wheels, slots, extra petrol tank, etc.

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Any make of new or second-hand aircraft supplied. Prices from £185.

Write for full list and particulars:—
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8-9 Passenger Metal Wessex, 3/140 h.p. Genet Major Engines, with C. of A. for 1 year.
Full particulars from Box No. 8706, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.
Hire Purchase Terms Arranged.

FINEST VALUE IN USED AIRCRAFT

SPARTAN. Hermes II engine, slots, self-starter, extra instruments. C. of A. 1 year. Price..... **£200**

SPARTAN ARROW. Hermes II engine. 166 hours since complete, nil since top, total hours 400. Fitted with metal propeller, slots, wheel brakes. C. of A. July, 1935. Price..... **£300**

PUSS MOTH. C. of A. October, 1935. 340 hours, engine 50 hours since complete overhaul, fitted bronze head metal propellers, turn indicator, spats, special colour scheme, polished engine cowling, red leather upholstery, sun blind or luminous instruments, spade stick, very attractive appearance. Price **£585**

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COMPER SWIFT (Pobjoy R). C. of A. May, engine hours 40 since complete, spats, very smart, £235. Roger Frogley, Broxbourne Aerodome. Tel.: Hoddesdon 453.

AEROPLANE wheels and axles all sizes, from 30/-. Falcon engine, £10. Le Rhone Avro with new main and tail planes, £10. Willesden Aircraft, 437a, High Road, Willesden, London. 'Phone: 5619.

"LEOPARD" MOTH for Sale; only done 200 hours; fitted dual control and navigation lights; twelve months C. of A. Write: Box No. 8707, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

Aircraft and Engines Wanted

WANTED, secondhand light aero engine, preferably Bristol Cherub, A.B.C., or similar type; also suitable air screw. Box No. 4625, c/o "Flight," Dorset House, Stamford Street, S.E.1.

WANTED. PUSS MOTH. Preference from private owner, excellent condition, never used for tuition, fully modified. de Caritat, 21 Rue Taxandres, Brussels (Belgium).

Patent and Trade Mark Agents

STANLEY, POPPLEWELL & FRANCIS, Chartered Patent Agents, 88-90, Chancery Lane, London, W.C.2. Telephone: Holborn 6393. Established 1879.

A. P. THURSTON & CO., Chartered Patent Agents, 329, High Holborn, W.C.1. Tel.: Hol. 1117.

F. J. CLEVELAND & CO., Chartered Patent Agents, 29, Southampton Buildings, London, W.C.2. Telephone: Holborn 5875-6.

GEE & CO. Patents and Trade Marks throughout the World. (H.T.P. Gee, Mem. R.S.G.B., A.M.I.R.E., etc.), 51–52, Chancery Lane, London, W.C.2. (2 doors from Govt. Patent Office). 'Phone: Holborn 1525. Handbook free.

ADVICE, Handbook, and Consultations free. 49 years' references. King's Patent Agency Ltd., 146a, Queen Victoria Street, E.C.4. 'Phone: City 6161.

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AIR SURVEY CO., LTD., Hayes, Middlesex. Established 1924. More than 100 surveys successfully executed. Prepared to tender for surveys of every description in any part of the World. Telephone: 632 Hayes, Mdlx. India Branch, Dum Dum, Calcutta.

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'Phone: Hounslow 2345.
Barton Airport, Manchester, Lancs.
'Phone: Eccles 1873.



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Schools

FLYING INSTRUCTION. — Trial Lesson, 10s. 6d. Dual 37s. 6d. per hour. Solo 27s. 6d. per hour.—The Hampshire Aeroplane Club, Southampton. 'Phone: Eastleigh 170.

CAMBRIDGE.

Tuition from 30s. per hour. Air Taxis, from 6d. per mile.
MARSHALL'S FLYING SCHOOL, LTD., CAMBRIDGE.
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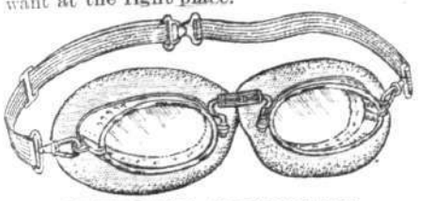
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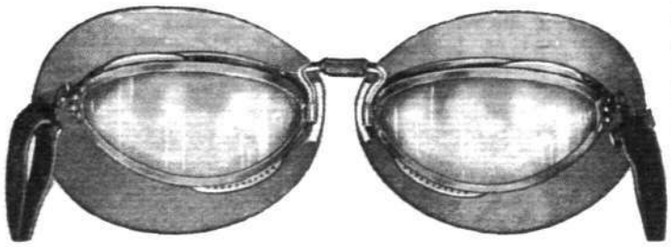
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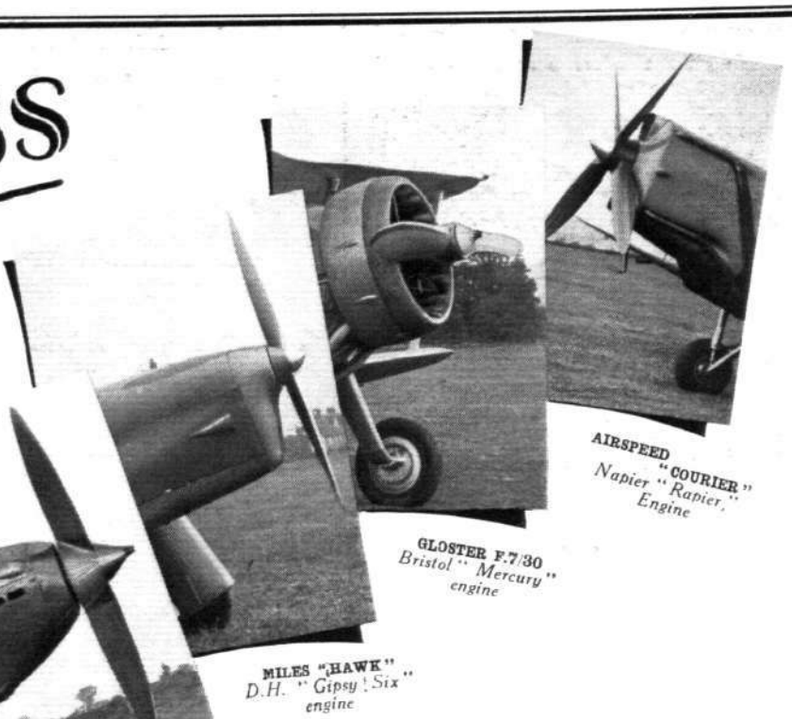
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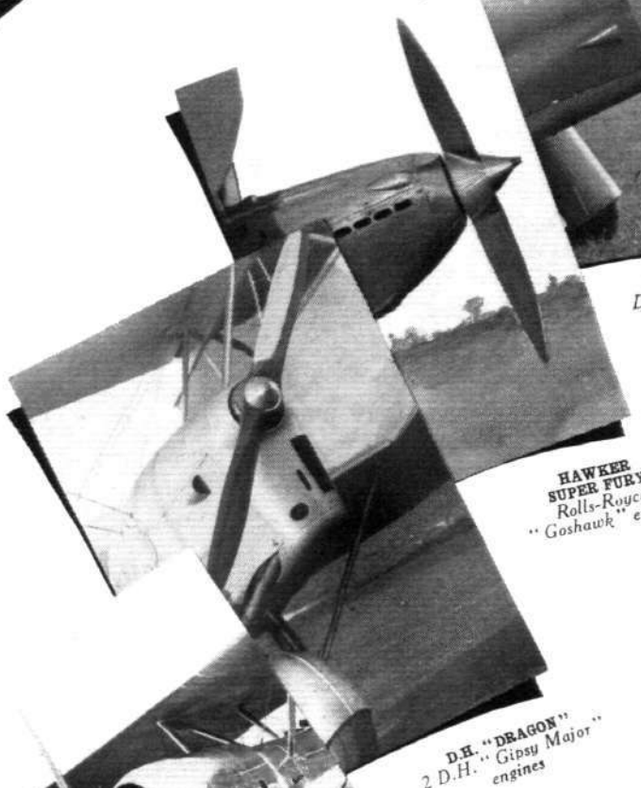
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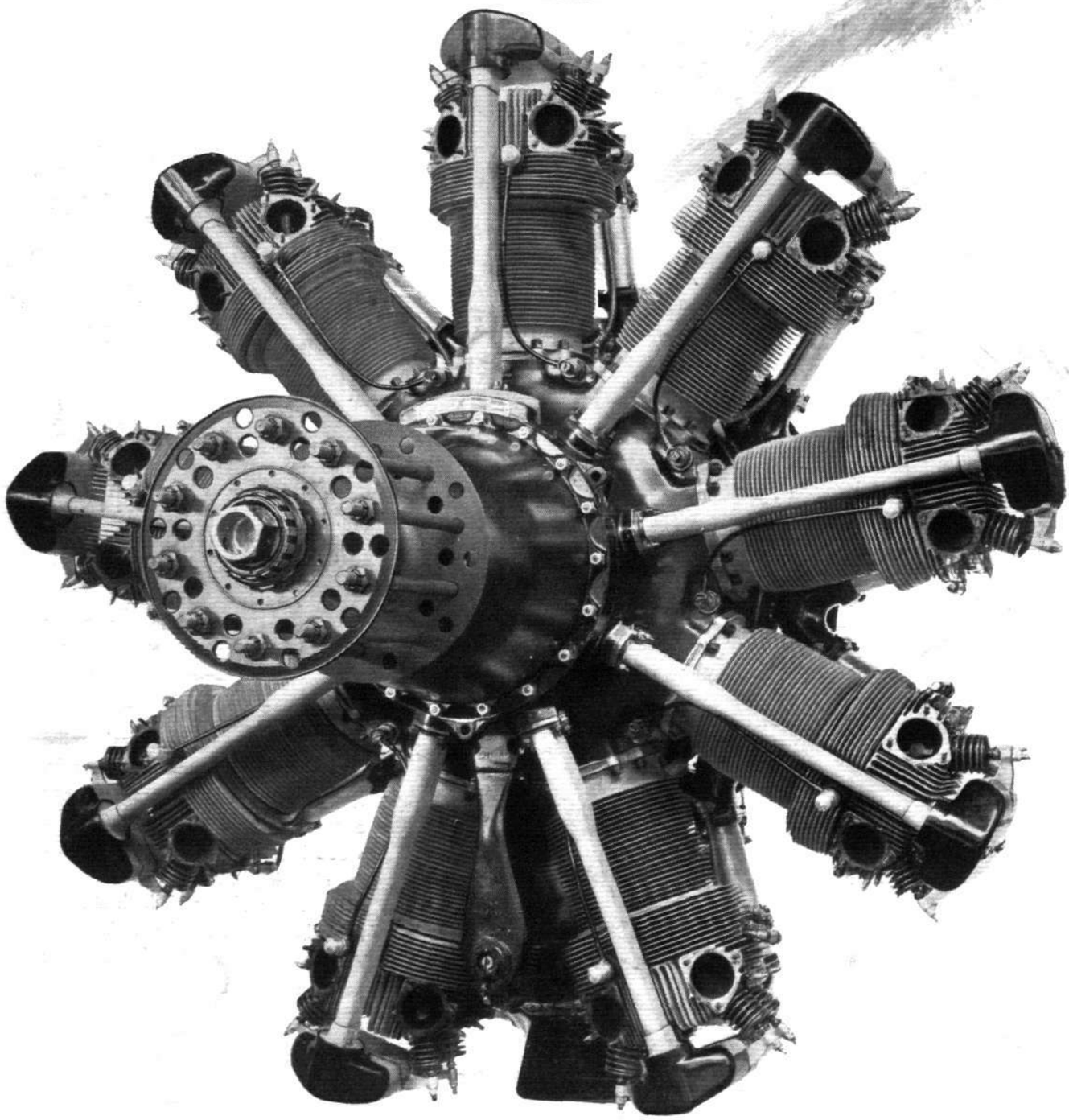
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